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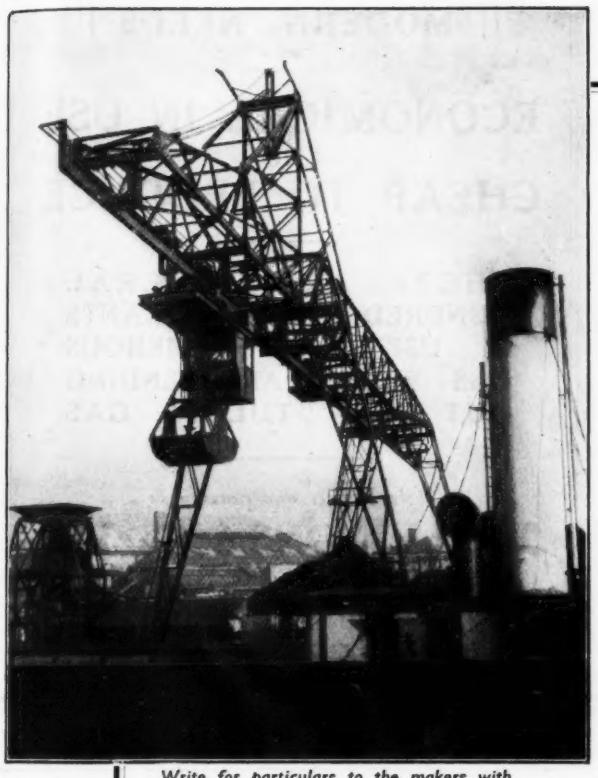

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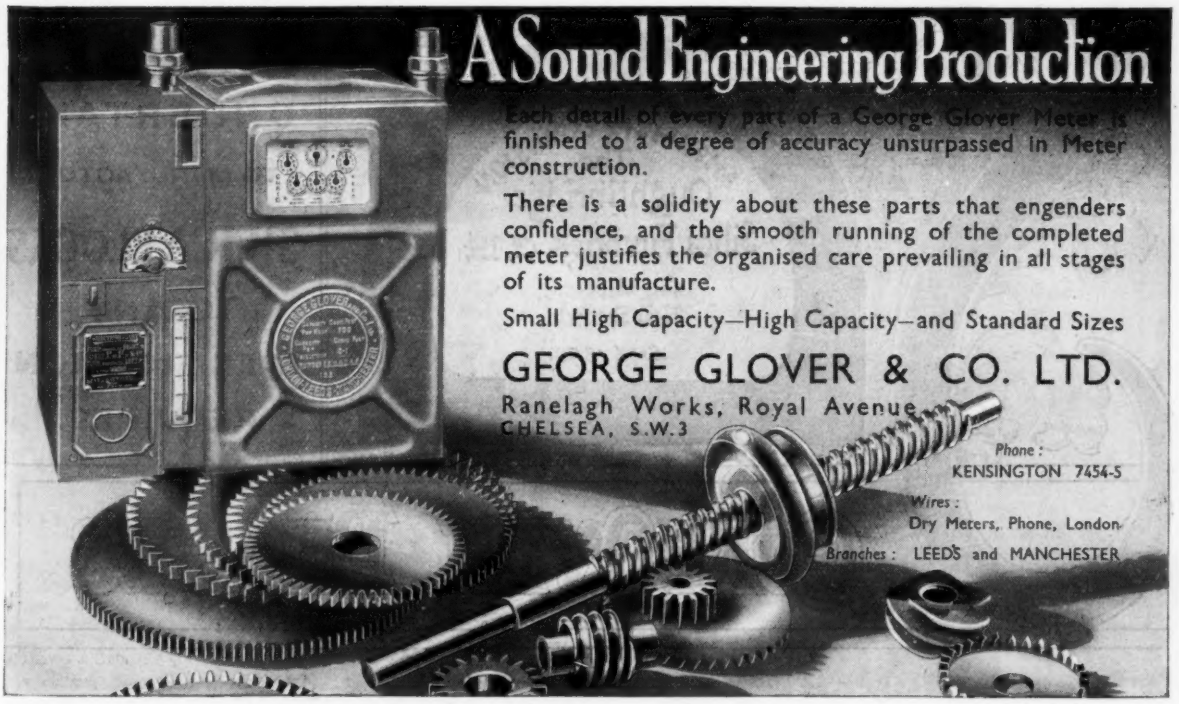

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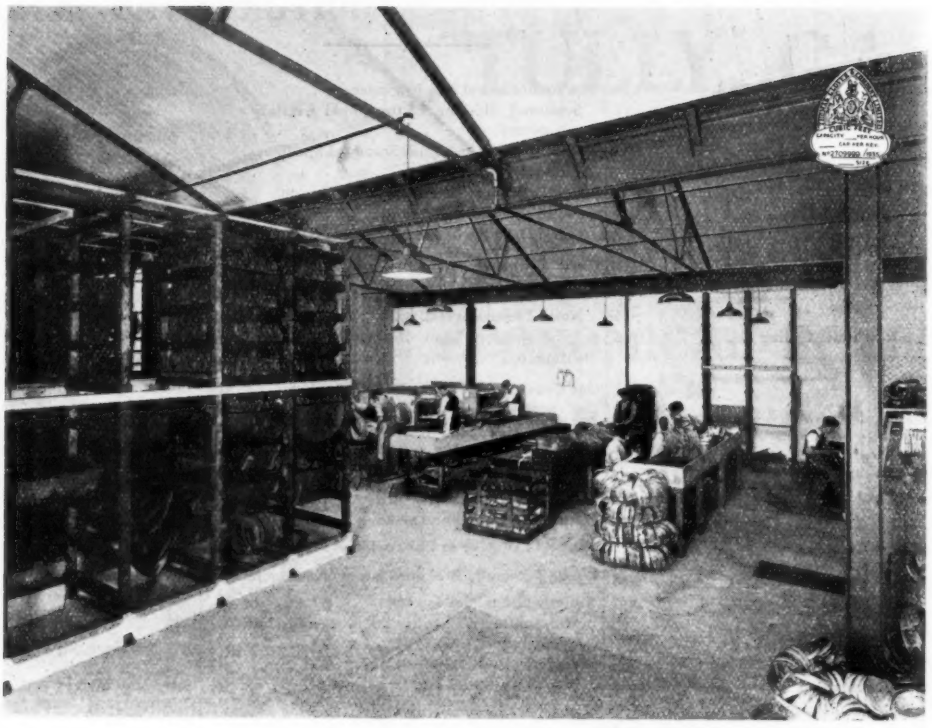

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Gas Journal

OCTOBER 30, 1935

Vol. 212. 87th Year No. 3780

Editorial Notes

Coke Oven Research

In his Presidential Address to the Coke Oven Managers' Association last year Mr. G. J. Greenfield put in a plea for a much larger measure of research in the coke oven industry. At the time, while thoroughly agreeing with Mr. Greenfield that greater research was called for within the coke oven industry, we asked how this research was to be financed, and whether it was to be in collaboration with other institutions and societies facing similar problems or in part via the universities. And, if so, we asked when the approach to other bodies was to be made. Now, as then, we cannot visualize full success without the collaboration of others working on the same and similar problems; as yet, however, no practical plan for joint discussion appears to have fructified. That the Association will be well advised to marshal its ideas and formulate some means of approach to bring about this better understanding is obvious from the Presidential Address of Mr. T. Westthorp to the Association last Thursday. This Address, too, is a plea for organized research, and organized education for the personnel of the industry.

Mr. Westthorp urges that as much research as possible should be done by coke oven undertakings themselves—an arrangement which may present difficulties to small companies. For these, however, the alternative would seem to be joint research controlled by and for themselves. Information to be of practical value, he maintains, should be obtained on plant approaching full scale. As conducted at present this renders progress very slow. The need is for a joint research establishment, and the financial and other important factors involved in such a project should not be insurmountable. The first thing, of course, is the provision of funds. We understand that as things stand at present the sum set aside for research and development by the coke oven industry—including contributions made by the iron and steel industry and also the grant received from the Government—amounts to less than one-tenth of a penny per ton of coke produced. Not a great deal can be accomplished with a contribution of this nature, and the coke oven owners will have to alter their ideas if the objects of the Coke Oven Managers' Association are to be achieved.

That the fulfilment of these aims is desirable—indeed, essential—received ample endorsement by the speakers at the Association's dinner which followed last week's meeting. Sir Cecil Cochrane, who heartily backed up the President's plea, also agreed with him as to the advisability of large-scale investigations on existing coke oven plants in the various districts. Could not the owners of great plants put at the disposal of the Fuel Research Board or the Coke Research Committee two or three ovens for a period over which full-scale experiments could be carried out? The researches could be undertaken by a travelling staff, and additional expense might be reimbursed to the owners of the ovens out of a common pool. As a member of the Fuel Research Board, Sir William Larke remarked that the Board would, he felt sure, be delighted to know that the coking industry was establishing a collective research scheme under its own auspices and its own management, even if this only went the length of providing machinery and channels whereby the experience of each member of the industry was made available to all others.

Co-Operative Selling

In these columns last week we discussed the problem of the marketing of coke oven coke with particular reference to an important Paper given by Dr. G. E. Foxwell and Mr. W. L. Boon to the Northern Section of the Coke Oven Managers' Association. In this regard we emphasized strongly that antagonism between the coke oven industry and the Gas Industry would be disastrous for both industries, and that antagonism is wholly unnecessary. We suggested that the potential field for smokeless fuels is vast enough for both the coke oven industry and our own Industry, but that while we are organizing for domestic selling in the smokeless fuel market the coke oven industry, instead of adopting the policy of co-operation and co-ordination, is indulging in individual selling and price-cutting to the disadvantage of all concerned—producer, distributor, and consumer. We urged the coke oven industry to organize for sales, taking its cue from the experience of the London and Counties Coke Association of the policy of co-ordination and of promoting the use of coke as a domestic fuel. It was therefore gratifying to us that our views found such wholehearted support at the Coke Oven Managers' dinner. Sir Cecil Cochrane said it was a lamentable fact that there had been up to now little or no co-operation among coke producers, with the result that they were obtaining lower prices for their products than they might have been if they were not cutting each other's throats. An organization for selling, maintained Sir Cecil, must be set up, and the requirements of the consumer must be met. Coke must be sold on the basis of quality and uniformity—a point we have emphasized persistently in these columns. Above all, the coking industry should look upon gas undertakings not as competitors but as friends; and the relations need not stop

at selling gas to the gas undertakings but might easily be extended to making reciprocal arrangements with regard to selling coke.

The desirability of much closer co-operation between the Gas Industry and the coke oven industry was stressed by Colonel Carr, President of The Institution of Gas Engineers, in a characteristically forceful speech. The object of both industries is to supply cheap and convenient smokeless fuels, and there are possibilities for common research not only in regard to the quality of coke but also in the utilization of gas. The time has passed, maintains Colonel Carr, for the two industries to work independently of each other; and we hope that his remarks and those of others at the dinner will help to bring our Industry and the coke oven industry into much closer co-operation than hitherto—to the benefit of both and the consumer.

Street Lighting

LAST week saw the publication of an Interim Report by the Departmental Committee on Street Lighting appointed by the Minister of Transport in June, 1934—a Report which contains many important recommendations and which is of vital concern to the Gas Industry, which supplies the illuminant for about 70% of the street lamps in the country. The Report is to be welcomed. It contains many obviously useful recommendations. On some aspects of the problem, however, guidance is not given—in particular definition of a standard of lighting for roads of the class under consideration. The Committee are not prepared to recommend any code for general adoption "even to a well-defined type of traffic route." They do not accept in all its details the British Standard Specification as a means for defining the special lighting requirements of traffic routes. We must bear in mind, however, that this is an Interim Report, and that the question is receiving the active attention of those responsible for the Specification—which, according to the Report, "appears to be the most quantitative reference which exists." It is of interest that the Committee are not satisfied that codes of other countries offer any advantages compared with our own Specification. At present full-scale tests are being carried out with the co-operation of both the gas and the electrical industries.

We will set out here some of the main findings of the Committee. The responsibility for street lighting rests, of course, with the numerous local authorities; and one reason for the present unsatisfactory state of affairs is the lack of co-ordination between these authorities, and their varying financial resources. Emphasizing this point, the Report cites three examples. On 31·8 miles, lying wholly within one County, of a heavily trafficked Class 1 road, of which 21·6 miles are in built-up areas, there are in use 19 different lighting systems controlled by 24 different lighting authorities. The systems range from B.S. Specification Class E to Class H, and in some of the built-up areas no lighting whatever is provided. It has been estimated that if this length of road were lighted to an adequate standard and the provision of the lighting was to remain the responsibility of the authorities of the various districts which the road traverses, the cost to the smaller authorities would mean a rate approaching 10s. in the £. Moreover, the traffic is of little direct value to the district. If, on the other hand, the County Council was the lighting authority, it is estimated that the whole length of road could be adequately lighted for a county rate of approximately 0·65d. Another instance is 13 miles of arterial road in which there are 27 varying standards of lighting ranging from reasonable adequacy to none at all. The third case concerns a popular route used as an exit from central London. Five authorities control the lighting of four miles of the route, and the standard of lighting is described as varying from excellent to bad.

Need for Uniformity

THE Committee urge reasonable uniformity in the lighting of a traffic route and are satisfied that the present system of administration does not provide for this. The responsibility for the lighting of classified roads, it is suggested, might well be confined to large administrative units, and the cost of lighting such roads to an appropriate standard might well be aided by grants from national funds. On the assumption that all classified roads in County Boroughs and 20% of classified roads in Counties are lighted to the appropriate standard the annual cost would be £3,500,000. The present expenditure must, of course, represent a material portion of this sum. Pending alteration of the present administrative system, the Committee recommend that authorities contemplating the installation or improvement of lighting of roads within their area should confer with adjoining authorities with the object of securing uniformity of lighting on roads of common interest.

Let us turn again to the technical aspect. The Committee make several important recommendations. One is that for traffic routes the minimum standard of lighting should be that which enables drivers to proceed with safety at 30 miles an hour without the use of headlights, and that on such routes the lighting units should be of at least the number and power of those required for a generously planned Class F of the British Standard Specification. In regard to the distribution of the available light, this must be governed by circumstances, but, provided there is no undue glare, the light should be so employed as to produce the maximum contrast between the brightness of the object to be viewed and its background. Special care should be taken to ensure the adequate lighting of kerbs and footways. As for the positioning of the light sources, the recommendation is that a mounting height of 25 ft. with a 6 ft. overhang beyond the kerb should be generally adopted. Normally the distance between lamps should not exceed 150 ft., but it is pointed out that the positioning of the lamps should be studied with a view to securing the best visibility, rather than uniform spacing. On bends the lamps should be placed on the outside of the curve, but with this exception single-side lighting is condemned. Also in connection with bends the Committee recommend that lighting authorities should consider the provision of artificial light-coloured backgrounds upon which a sufficient amount of light could be directed to enable drivers to realize the existence of the bend and against which pedestrians would be rendered visible by contrast. The provision of white kerbs at bends should also be considered. Though the Committee deal with only one particular class of road, they emphasize that there should be easy gradation from the standard adopted for such roads to that obtaining in side streets. It is also maintained that all street lighting installations should be complete in themselves and that no reliance should be placed on any extraneous means of lighting.

We are not surprised to note the Committee's insistence that if lighting schemes are to be properly designed and the installations satisfactorily maintained the local authority concerned should be advised by an engineer competent to deal with the problems which arise. Good lighting cannot be expected if the officials responsible are primarily concerned with some quite unrelated activity, as often obtains to-day.

Smoke Abatement

THE value of any smoke abatement movement as a national "cause" can hardly be denied from whatever viewpoint it is regarded. To whatever demand is made for smoke abatement the Gas Industry can claim to have the complete answer, and it is faith in this fact which justifies its contribution of so large a proportion of the total financial support of the National Smoke Abatement Society on business grounds alone, even if, as good citizens and possessed from the very nature of our profession of a proper understanding of the matter, we had no other reason for supporting so good a cause.

These thoughts are prompted by the Sixth Annual Report of the Society, and, truth to tell, the total funds at disposal are comparatively so meagre for so good a cause that even odd guineas would pull their weight. Our suggestion is that hundreds more gas undertakings should join up, even if to the extent of what to them might amount to only nominal subscriptions, and so begin to take in a great national cause a more personal interest which at the same time would strengthen their confidence in their own products. And in our view it is still confidence above all else which the Gas Industry needs.

If this appears to be an appeal to selfish motives we do not mind, because we honestly believe that the cause of smoke abatement can be better served by the Gas Industry than in any other way. At the same time the *doctrine* of smoke abatement can best be propagated by a national movement which has no vested interest in any particular means of abolishing smoke, but works only towards making the nation conscious of the importance of safeguarding health and property. Provided the Gas Industry keeps at least abreast of alternative methods in its commercial policy, we need have no fear of the results.

Again, it is with the same self-confidence that we must accept the Society's Annual Report, even if in parts it appears to us somewhat retrograde. We need not, for instance, worry unduly about references to research for a smokeless coal fire—a development which would be welcomed by the Society "if only to secure the interest, instead of the antagonism, of certain sections of the coal industry which actively oppose smoke abatement because it means the sale and use of coal in forms other than the traditional." On the contrary, we must look at the Report as a whole, and rejoice that "the year under review has been the most satisfactory on record, and more clearly than ever is it to be seen that real progress is being made and that the movement is advancing at an accelerating rate."

As evidence of such progress, reference is made to the now well-known Report of the Special Committee appointed by the Manchester City Council [see "JOURNAL" for July 17] which enquired into "the desirability and practicability of making available to the public smokeless fuels, including gas and electricity, at such cost (not including a charge upon the rates) in relation to raw coal as will permit their use in preference to coal, and thus make a definite contribution to a cleaner atmosphere."

Gas Has Duties

UP to comparatively recent times the Gas Industry failed to do its complete duty in the cause of smoke abatement in the solid fuel market, and it complained bitterly and continuously that it was not allowed, by legislative restriction, to do its full duty with gaseous fuel. But times have changed, and under the lead of such pioneers as Liverpool in the North and the London and Counties Coke Association in the South tremendous advances have been made towards supplying the public with a solid fuel which they can substitute for smoke producing fuel with every satisfaction to themselves. The improvement is not yet universal, but it is well on the way, and those gas undertakings which have not already taken steps to produce coke in a fit state for the market and to create or satisfy the market which exists for good coke are at least feeling uneasy about it. The sooner they take the necessary steps the better it will be for them, for their neighbours, and for the whole Gas Industry. The greatly improved reputation which gas coke has achieved in recent years must be sustained.

As regards smokeless gaseous fuel, the "antiquated shackles" (as the Industry used to rejoice in calling them) have gone long since—long enough at all events to allow some of the gas undertakings which were faced with the most difficult cases to evolve new systems of charging for gas which enable the public to adopt the comfort and cleanliness of gas service for all purposes at no added cost to themselves. We have recorded and commented upon such cases from time to time over the past year. But is not this in itself a strange commentary upon the mentality of the Industry, that only "from time to time" do new business building rate structures appear; that they are not by now so commonplace as almost to have lost news value?

It is not stating the case too strongly to say that the response to the new freedom has not yet been anything like in proportion to the clamour there used to be about the old shackles, and that the Industry, whether through lack of confidence or for other reasons, is not making its full contribution to the smoke abatement problem while it continues as a whole to offer its main product at what amount, for many potential uses, to luxury prices.

Smoke abatement so far, when reduced to the personal case, probably amounts to each man thinking that his neighbour should do the abating first. But such examples as the Manchester Report, and the remarkable progress with smokeless housing schemes in Leeds, testify to the way in which public opinion is beginning to move. Let us, therefore, give every support to the National Society which is doing so much to accelerate the movement—greatly to the national advantage—by placing at disposal the best possible fuel for smoke abolition at rates which make its universal adoption feasible. If we are not prepared to satisfy the growing demand there will be others who are.

Sales Policy

THAT Mr. C. Bateman, of Harrogate, is alive to the need for pursuing a vigorous sales policy to meet and overcome electrical competition is evident from the Paper he gave to the Manchester District Association of Gas Engineers at their last meeting. The contribution has particular reference to the activities of his own Undertaking during the past two years, and it contains useful information and suggestions. From time to time we hear of the loss of consumption brought about by the replacement of old appliances by their modern equivalent. This, of course, is perfectly true; but Mr. Bateman has carried out tests to indicate what this loss may mean. On an extreme case—and there must be many such "extreme" instances—it amounted to a matter of 58%. Exactly the same meal was cooked, first in some of the older patterns of black cooker being returned from the district, and then in a thermostatically controlled cooker of the latest type. On average, the black cookers consumed 41·5 cu.ft., while the consumption of the latest cooker for the same work amounted to only 17·5 cu.ft. Even what Mr. Bateman terms a "modern cooker," not fitted

with thermostatic control, consumed 85 cu.ft., or twice as much as the up-to-date one, for identical service. These figures constitute a tribute to the appliance manufacturers and a bulwark against electrical competition, while showing the need for all of us to extend the uses of gas in directions other than cooking if we are to build up the consumption per consumer. Obviously the attack must be on the water heating and space heating loads, and Mr. Bateman's expressed belief in attractive tariffs as one of the best weapons of attack leads us to hope for interesting news in this connection from Harrogate before long. It is a pressing problem.

However, he does show how, as a result of persistence and a full knowledge of the relative merits and economies of gas and electric cooking on the part of the Gas Undertaking, the authorities of the new General Hospital were persuaded—greatly to their advantage—to abandon electricity in favour of gas. Six years ago the Building Committee decided, on the grounds of "efficiency, economy, and utility," to have the cooking done by electricity. Expensive electrical apparatus was installed. For a time all was well; but a series of breakdowns and continuous heavy bills began to shake the authorities' faith in electricity. There is no need for us to go into detail about the matter; suffice to mention that in 1934 the Hospital scrapped their electrical apparatus and turned gratefully to gas—which event, observes Mr. Bateman, "has had a psychological effect throughout my area of supply, and has no doubt helped indirectly in retaining and increasing our business."

Mr. Bateman's views on the value of showrooms and their efficient staffing and arrangement are, of course, perfectly sound. The Harrogate Company has absorbed six smaller undertakings, and the district is now spread over an area of 200 square miles. There are already four district showrooms, and in the near future all six districts will be similarly served. A Home Service Department has been organized and last year Mr. Bateman decided to form a Women's Gas Development Association. This Association has now a wide membership and is carrying out most excellent work; it is a scheme which should commend itself to other undertakings—especially in view of the recent establishment of a Women's Gas Council. We would refer also to Mr. Bateman's activity in creating a new gas load in connection with the Accredited Milk Scheme recently introduced by the Milk Marketing Board. Sterilization is one of the requirements of the Scheme, and in Harrogate a special salesman who is familiar with all the regulations and conditions relating to Grade A licences has been allocated to deal with this new load. Here also is a hint for other gas undertakings.

Next Week's Research Meeting

It is safe to anticipate a good attendance and many lively discussions at the Seventh Autumn Research Meeting of The Institution of Gas Engineers to be held in London on Tuesday and Wednesday of next week. These research meetings are by no means "joy riding conferences." From start to finish it is all solid hard work. Experience of previous meetings, however, proves clearly enough that the personnel of our Industry dislike neither hard work nor hard thinking. The value of research work to the Gas Industry was never more highly appreciated than it is now, and never before has there been such anxiety that the lines this work follows should be the most productive. And in regard to this controversial matter we look forward particularly to the opinions which will find expression at the final session during the general discussion on the First Report of the Research Executive Committee and on Gas Research and Investigation. Of all the discussions most time is to be allocated—and, we think, quite rightly—to this one.

The amount of information contained in the "blue books" this autumn is on the customary grand scale. For example, the Thirty-Seventh Report of the Joint Research Committee of the Institution and Leeds University, concerning the operation of carburetted water gas plant, runs to a matter of 156 pages. There is welcome variety about the fare provided, and the different Reports show to what extent the field of research is developing in the Gas Industry and how increasingly better equipped the Industry is to undertake investigational work and to interpret the findings. The programme arranged for the Meeting was detailed in last week's "Journal," and we know that it has met with warm approval. The Reports are a first-class tribute to our Industry's faith in the worth of research, and we are sure that the Meeting will be—as previous Research Meetings have proved to be—an inspiration to further effort. Our Industry, by placing a premium on research, has demonstrated far-sightedness.

Forthcoming Engagements

Nov.

2.—Wales and Monmouthshire Junior Association.—Meeting at Newport. Presidential Address of Mr. J. F. Rust.
5.—I.G.E.—Council, 9.30 a.m.; Council, 4.30 p.m.
5 and 6.—I.G.E.—7th Autumn Research Meeting at The Institution of Mechanical Engineers, Storey's Gate, St. James' Park, S.W. 1.
6.—Manchester and District Junior Association.—Visit to Prescot. Paper by Mr. F. N. Booth and Mr. J. Fletcher.
7.—S.B.G.I.—Council Meeting, 11 a.m., followed by the Autumn General Meeting.
7.—Midland Junior Association.—Meeting. Paper by Mr. R. G. Marsh.
12.—I.G.E.—Gas Education Executive Committee, 4 p.m.
14.—Southern Association (Eastern District).—Meeting at 28, Grosvenor Gardens, S.W. 1.
15.—London and Southern Junior Association.—Annual Dinner.
16.—Wales and Monmouthshire Junior Association.—Meeting at Port Talbot. Paper by Mr. David J. Heycock.
16.—Yorkshire Junior Association.—Meeting at Shipley. Presidential Address of Mr. J. W. Carlton.
16.—Western Junior Association.—Meeting at Exeter. Paper by Dr. C. M. Cawley, of the Fuel Research Department.
19.—I.G.E.—Session at the 8th Public Works, Roads and Transport Congress and Exhibition, Royal Agricultural Hall, London, N. 1, 3 p.m.
20.—B.C.G.A.—Executive Committee at 11.30 a.m.
21.—Midland Association.—Autumn General Meeting, Imperial Hotel, Birmingham.
22.—London and Southern Junior Association.—Meeting. Paper by Mr. W. Grogono, of Croydon.
29.—I.G.E.—Liquor Effluents and Ammonia Committee, 11.15 a.m.; Joint Research Committee, 2.30 p.m.
30.—North of England G.M.A. (Auxiliary Section).—Meeting at Newcastle-on-Tyne and Paper by Mr. D. Yule.

Dec.

3.—I.G.E.—Research Executive Committee, 2.30 p.m.
4.—Manchester and District Junior Association.—Visit to Birkenhead. Paper by Mr. A. J. Walker.
5.—Midland Junior Association.—Annual Dinner.
11.—B.G.F.—1st Annual General Meeting, Grosvenor House, Park Lane, London, W. 1, 3 p.m.; 2nd Annual Dinner, Grosvenor House, Park Lane, London, W. 1, 7 p.m.
13.—London and Southern Junior Association.—Paper by Mr. L. Friedman, of Ascot Gas Water Heaters, Ltd.

PERSONAL

Sixty Years in the Industry.

Many friends will wish to congratulate heartily Octavius Thomas upon the fact that to-morrow he will have completed sixty years' service with (and for) the Gas and Water Industries; and the writer regards it as an enviable privilege to be able, by the courtesy of the Editor, to do so in the pages of the "JOURNAL." His justification for thus putting himself forward is a close personal friendship with Octavius Thomas extending over precisely one-half the number of years just named. But doubtless there are many who could claim as much—or more, and probably any one of these could have performed the task more worthily, though certainly with no greater sincerity.

The writer counts himself especially fortunate in that so many of his meetings with him have been on those happiest of occasions, when Octavius has been among "the boys," as he loves to call them, at the golf meetings of the Wales Association. It was, indeed, on one of these occasions—at the Ashburnham Golf Links, near Llanelly, in May of this year—that the characteristic snapshot accompanying this note was secured by the writer. "The boys" were at the time far afield, engaged in deeds of prowess, and so circumstances favoured a chat, partly over past times, reviving memories which, in the autumn of life, must always be tinged with sadness, and partly over the present and the future, which, with our friend, are always filled with hope.

Octavius Thomas is happy in that he has lived to see the thought, the loyalty, the affection that he has unstintingly extended to others returned to him in generous measure. "Self" can never have counted less with anyone than it has and does with him, who is thus deserving to the full of the love and the gratitude that go out to him. In these days, the word "service" is sadly over-worked, but there is no straining of it in saying that his life *is* service. May his help and his encouragement be at hand for many more years to come.

The life-work of Octavius Thomas began on Nov. 1, 1875. Alderman Henry Bowen, J.P., was at that date Engineer and Manager at Cardiff (of which city he was at one period Mayor), and with him Octavius Thomas served his time. He remained at Cardiff to become Assistant Engineer under Mr. Henry Morley, but left in July, 1893, to act as Manager and Secretary of the Western Valleys Water and Gas Company at Risca, Mon. In March, 1898, he left Risca to take up the position of Engineer and Manager of the Rhondda Urban District Council's Gas and Water Works, at Pentre, which he held until his retirement in April, 1934.

The Wales and Monmouthshire Association (as it now is) of Gas Engineers and Managers—which, fortunately for them, brought him into close personal contact with so many of his colleagues—was formed in March, 1905, and ever since then our friend has been Hon. Secretary of the Association, even while acting as President. Indeed, he assisted the late Alderman Thomas Canning (the first President) to bring the Association into being. It began with about forty members, only eight of whom are now left. At the present time there are 140 odd members and associates. The Institution of Gas Engineers met at Cardiff in 1928, during the Presidency of Mr. H. D. Madden, and readers do not need to be reminded of the large share taken by Octavius Thomas in the arrangements connected with a conspicuously successful meeting.

During the 36 years which he spent at Rhondda, he saw the population double, and he increased the capacity of the Gas-Works to permit of an output three times as large as was possible when he went there. At the time of his leaving, a population of some 90,000 was being supplied.

And now for just one more reflection. While those personal qualities, which have gained for our friend a place deep down in the hearts of all of us, were derived from a higher source than his technical literature, it is with considerable pride that the writer places upon record Octavius' declaration that the only information he was able to get in his early days was by reading the "GAS JOURNAL," which he has continued to do throughout the period of his connection with the Industry.

A. H.

* * *

Presentation to J. K. Frazer.

On Oct. 16, Mr. John K. Frazer, formerly Manager of the Dalmarnock Works of the Glasgow Corporation, whose retirement was announced in the "JOURNAL" for Sept. 11 last, and who has been associated with the Gas Industry for over 40 years, was entertained at dinner by the past and present members of the Scottish Junior Gas Association (Western District) in the Grosvenor Restaurant, Glasgow.

The Engineer and General Manager of the Glasgow Corporation Gas Department, Mr. J. W. McLusky, who presented Mr. Frazer with a gold watch and a gift for Mrs. Frazer, went on to pay high tribute to the excellent attributes of Mr. Frazer. Mr. McLusky said he greatly admired the work that was being done by the Juniors, and added that it was his belief that this fine body of virile young men who were so full of enthusiasm would rapidly put an end to any lack of co-operation between neighbouring undertakings. In reply, Mr. Frazer said that he appreciated the great honour that had been conferred on him but was at a loss to express his gratitude. He was not so much moved by the gifts themselves as by the kind motive that had prompted the Association to so kind an action.

Others who spoke at the dinner included Mr. J. Bell, Engineer, Manager, and Secretary, Dumbarton, Mr. J. Dickson, Kirkintilloch, President of the North British Association, and Mr. David Fulton, Helensburgh.

* * *

Mr. CHARLES R. INGHAM, Engineer and Manager to the Brighouse Corporation Gas Department, has been appointed to the position of Engineer, Manager, and Secretary to the Cannock District Gas Company and will commence his duties on Jan. 1, 1936.

* * *

The Leamington Town Council have unanimously decided to invite Alderman CHARLES HERBERT SOUTHORN, F.S.I., J.P., to fill the Mayoral Chair in the coming municipal year. Mr. Southorn, who is keenly interested in public work, is a Director of the Leamington Priors Gas Company.

* * *

The Kirkconnel Gas Company has appointed Mr. HUGH TANNER, Assistant Engineer and Manager to the New Cumnock Gas Company, Ltd., to be Manager in succession to Mr. R. Stevenson, who has accepted a similar position at Moffat.

Obituary

Professor John Goodman.

Professor John Goodman, for 32 years Professor of Civil and Mechanical Engineering at Leeds University, died on Oct. 28 in a Leeds nursing home.

Professor Goodman was appointed to the Chair in 1890, and on his retirement in 1922 was made Emeritus Professor, with special accommodation assigned to him by the University Council so that he might carry on his independent research work. In 1896 he became associated with Mr. W. J. Jenkins in the formation of the firm of W. J. Jenkins & Co., Ltd., of Retford. Mr. Jenkins died in 1911, but the continuity of control of the firm was carried on by Professor Goodman, who eventually became Chairman of the Company, from which position he retired in 1932.

News in Brief

A Decrease of One Shilling per 1,000 cu.ft. in the price of gas has been intimated by the Oldmeldrum Town Council.

"**Christmas Fare**" forms the subject of a recent addition to the "A Thousand and One Uses for Gas" series issued by the British Commercial Gas Association.

Applications are Invited for the position of Engineer and Manager of the Brighouse Gas Department at a salary of £550 per annum. The person appointed will also be responsible for the public lighting of the Borough.

An Increase of 2·39% over the corresponding period of last year in the output of gas for September was reported by the Engineer, Mr. F. Blackburn, at a meeting of the Gas Committee of Plymouth City Council on Oct. 24, the last meeting of the municipal year.

Half an Hour's Electricity Failure caused confusion at Chapel-en-le-Frith, New Mills, Marple Bridge, Charlesworth, and Chisworth on the night of Oct. 25. Hundreds of houses were affected, and the programmes at two cinemas were seriously interfered with. Lights on the Buxton-Stockport main road also failed.

As the General Election is Taking Place on Nov. 14, the Autumn General Meeting of the Midland Association of Gas Engineers and Managers has been postponed to Nov. 21. The Meeting will be held at the Imperial Hotel, Birmingham, and not, as was announced earlier, at the Grand Hotel.

Application for a Special Order is intended to be made to the Board of Trade by the Stretford and District Gas Board with the object *inter alia* of redefining the constitution of the Board by reference to the Constituent Authorities as now existing and to make provision in regard to the retention and disposal of lands by the Board.

The Radiation Clinical Gas Lamp was the subject of an interesting lecture by Dr. D. A. Winter, of Radiation, Ltd., to a number of local doctors and members of the Gas Department staff at the Town Hall, Hereford, on Oct. 22. Mr. Arthur Roberts, the Department's General Manager, introduced the speaker to the audience.

A Good Attendance marked the opening lecture of a series arranged by the Home Service Section of the Alliance and Dublin Consumers' Gas Company at the Demonstration Theatre in d'Olier Street last week. The demonstrators were Miss Lawless, who prepared a simple dinner, and Miss Patricia Sides, who gave a practical lecture on supper dishes.

A Novel Stand has been organized by the Liverpool Gas Company at the Liverpool Home and Fashions Exhibition, now being held in the Renshaw Hall. This takes the form of a series of hearth sections, each laid out as part of a room in a house. Demonstrations are given with the latest appliances in space heating, water heating, and cooking.

Dividends for the Current Year were declared by the Directors of Meters, Ltd., Manchester, 3, at the following rates: On the preference stock 5½% per annum, and on the ordinary stock 5% per annum. The dividend warrants will be posted on Nov. 14, and to enable the same to be prepared, the transfer books will be closed from Oct. 28 to Nov. 7, both days inclusive.

Gas is Used for Cooking at the Gaumount Theatre, Oxford Road, Manchester, which was opened by Jessie Matthews and Sonnie Hale on Oct. 19. The equipment in the theatre café and in the Long Bar has been supplied and fixed in collaboration with the Manchester Gas Department. All hot water for the entire theatre is heated by gas. An advertisement appearing in the Manchester papers says "Granada goes Gaumont. . . .Gaumont goes Gas."

An Exhibition of Gas Appliances, held in Heywood from Oct. 14 to 19, 1935, was opened in the presence of a large gathering by the Mayor, Alderman A. E. Goldstone, J.P. Half-a-dozen of the leading appliance manufacturers co-operated to make a very pleasing display. Cookery lectures and washing demonstrations were given daily and each proved a great source of attraction. In connection with the former, a cake-baking competition was arranged in which gas consumers were invited to compete. This proved very popular, and showed to advantage how efficient the modern gas cooker has become. The prizes were presented to the successful entrants by the Mayoress, Mrs. Goldstone.

An Interim Dividend has been resolved by the Board of the Imperial Continental Gas Association out of the profits for the half-year ended Sept. 30, 1935, at the rate of 4% (actual) on the £5,600,000 capital stock of the Association. This will be paid, less income-tax at 4s. 6d. in the £, on Nov. 15. The Transfer Books of the Association will be closed from Oct. 31 to Nov. 13, 1935, both days inclusive.

The Gas Meter Testing Committee's Report for the year ended March 31, which was recently adopted by the Salford magistrates, states that the number of meters tested during the year under review was 27,426, compared with 26,602 in the previous year, an increase of 1,224. Of the 27,426 meters tested, 2,625 were wet meters and 24,801 were dry meters. The percentage of meters rejected was: Wet 3·58. Dry 2·89.

To Celebrate the 30th Anniversary of the founding of the Midland Junior Gas Association a Dinner is to be held at the Imperial Hotel, Temple Street, Birmingham, on Dec. 5 at 7 p.m. During the evening the presentation of medals to the past-Presidents will be made by Col. W. M. Carr, O.B.E., T.D., President of The Institution of Gas Engineers, and the Milbourne Medal for Session 1934-35 will be presented to Mr. A. Knight by the donor, Mr. R. J. Milbourne, J.P.

Extensive Alterations to the Offices of the Berwick and Tweedmouth Gaslight Company are at present being carried out, and when completed the premises will be among the most up-to-date in the east of Scotland. A new front is being erected and the whole of the ground floor being used as a showroom with walls of oak panelling and rich cornice to the ceiling. The caretaker's house to the rear of the building is also to be converted into offices connected with the showroom.

Amalgamation and Grouping

United Kingdom and Prescot.

We learn from a local correspondent that the United Kingdom Gas Corporation, Ltd., has made an offer to purchase the Prescot and District Gas Company. The purchase price offered is on the basis of £114 5s. for every 100 5% ordinary shares; £150 for every 100 6% preference shares; £93 10s. for each £100 4% "C" preference stock; and others in proportion.

British Industries Fair Extension

New Building at Birmingham

A large extension to the buildings used for the Engineering and Hardware Section of the British Industries Fair at Castle Bromwich, Birmingham, has been approved by the Birmingham Chamber of Commerce which organizes this Section of the Fair in collaboration with the Department of Overseas Trade.

We are informed by Mr. J. Percy Plant, Chairman of the Fair Management Committee, that the decision to extend still further the buildings at Castle Bromwich was made necessary by the increased demand for space in the Engineering and Hardware Section of the Fair. So far the Management Committee have received applications for 291,000 sq.ft. indoors, and only 265,000 sq.ft. are actually available at the moment. The extension consists of a new building 720 ft. long by 72 ft. wide and it will be added to the north side of the existing building, that part which is devoted to the electrical and engineering group. It will, in effect, be an addition to the width of the building at this end.

The addition will give the Committee 31,000 sq.ft. more space than they had at the 1935 Fair, making a total of 296,000 sq.ft. available for exhibits indoors in 1936.

"This year (1935) when the Section was held in May," Mr. Plant concludes, "the Gas Industry and a number of other firms who found the date unsuitable did not take space but other industries were encouraged by the fact that the Fair was held in May to exhibit in the Section for the first time. We now find that in 1936 when the Section returns to the February date the Gas Industry will once more, I am happy to say, be represented and many firms who were 'first year' exhibitors at the 1935 event are also applying for space in 1936."

The Institution of Gas Engineers

Sessional Meeting of the Royal Sanitary Institute.

Members of the Institution are invited to attend the Sessional Meeting of the Royal Sanitary Institute to be held in the Town Hall, Leamington Spa, on Friday, Nov. 15, 1935, at 4.45 p.m., when there will be discussions on "Medicine at Health Resorts," to be opened by Frank Clayton, M.A., M.D., F.R.C.P., and on "The Effects of Gas-Works Liquor on Sewage and its Treatment," to be opened by A. Key, Ph.D., B.Sc. Admittance tickets may be obtained from the Secretary, The Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1.

Recently Issued British Standard Specifications.

Copies of the recently issued British Standard Specification for Bacteriological Test Tubes, Durham Fermentation Tubes and Dreyer Agglutination Tubes (No. 625-1935), may be obtained, price 2s. each, from the Secretary, The Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1.

Public Works Congress and Exhibition.

Conferences under the auspices of The Institution of Gas Engineers at the Eighth Public Works, Roads, and Transport Congress and Exhibition (1935) to be held at the Royal Agricultural Hall, London, N., will take place in Congress Hall B on Tuesday, Nov. 19, at 3 p.m., under the Chairmanship of Colonel W. Moncrieff Carr, O.B.E., President of The Institution of Gas Engineers. Papers will be given by Mr. F. M. H. Taylor, Ph.D., B.Sc., A.R.C.S., M.Inst.F., of the Gas Light and Coke Company, on "Gas Utilization in Modern Buildings;" and by Mr. W. L. Boon, M.I.Mech.E., Manager of the London and Counties Coke Association, on "Coke Utilization in Modern Buildings."

Paper on Public Lighting.

Members who are attending The Institution of Gas Engineers' Session at the Eighth Public Works, Roads, and Transport Congress and Exhibition in London on Tuesday, Nov. 19, are invited to attend the Association of Public Lighting Engineers' Session at 11 a.m. on the same day, when the Chair will be taken by the President of the Association, Mr. A. Maurice Bell (Tottenham and District Gas Company), and Mr. E. C. Lennox (North-Eastern Electric Supply Company, Ltd.) will submit for discussion a Paper on "Public Lighting: Its Necessity and Administration." Copies of the Paper can be obtained from the Secretary of the Association (Mr. J. Stewart Dow) at 32, Victoria Street, S.W. 1.

The Calculus of Plenty.

The Eleventh Annual Norman Lockyer Lecture—established by the British Science Guild as a means of periodically directing the attention of the public to the influence of science upon human progress—will be given by Sir Josiah Stamp, G.C.B., G.B.E., LL.D., D.Sc., F.B.A., in the Goldsmiths' Hall, Foster Lane, E.C. 2 (by permission of the Goldsmiths' Company), on Wednesday, Nov. 13 next, at 4.30 p.m. The Rt. Hon. Lord Melchett, President of the Guild, will take the Chair. The subject of the Lecture will be "The Calculus of Plenty."

Admission Tickets can be obtained from the Secretary of The Institution of Gas Engineers (Mr. J. R. W. Alexander), 28, Grosvenor Gardens, S.W. 1.

North British Dates for 1936

The Secretary and Treasurer—Mr. Archd. Kellock—informs us that a Council Meeting last week fixed dates and venues for next year's chief events. The Spring Meeting will be in Glasgow on April 3, and the Annual Meeting in Kirkintilloch on Sept. 10.

Gas-Heated Air-Conditioning Plant

London News Theatre Installation

An interesting gas-heated air-conditioning plant has recently been installed in the new Monseigneur News Theatre in the Strand, London. It represents a triumph for gas in competition with oil-fired plant, for the Theatre occupies a section of the Shell-Mex building, and the oil concern naturally tendered for the contract.

The boiler unit is an Ideal "Britannia" coke boiler converted for the use of gas, and this gives an output of 325,000 B.Th.U. with a consumption of some 800 cu.ft. of gas per hour under full load. The burners are operated at normal draught, the gas passing through a governor to maintain the pressure at a constant level, while the boiler is controlled by a thermostat which may be set to give any desired temperature conditions in the auditorium of the Theatre.

A Pulsometer electrically-driven pump carries the hot water to the warming unit of the "Plenum" air conditioning plant, which is manufactured by Messrs. J. Jeffreys & Co., Ltd. This conditioning plant incorporates a suction fan which draws the air in from outside and passes it through a water-spray filter to clean it. The clean air subsequently passes through the radiator unit heated by the water from the gas boiler and is finally pumped into the auditorium of the Theatre in a clean warm state, while the vitiated air is at the same time withdrawn from the building. The pleasant atmospheric conditions within the auditorium of this Theatre are particularly noticeable, and it is gratifying that gas has been adopted in this up-to-date method of heating buildings of this description. We understand that several other Theatres of a similar nature are also using gas in conjunction with their air-conditioning plant.

It may be mentioned that the Monseigneur News Theatre are also using gas heated radiators for the heating of the Manager's room and other offices, while gas is used for cooking in the staff kitchen.

Scottish Juniors Visit London

On Oct. 19, members of the Scottish Junior Gas Association visited London as the guests of Thomas Glover & Co., Ltd. We published a full account of the day's proceedings in last week's issue of the "JOURNAL," but, owing to lack of space, the above picture was unavoidably held over. It shows the splendid gathering of over one hundred strong in front of the fine office buildings at the Gothic Works, Edmonton.

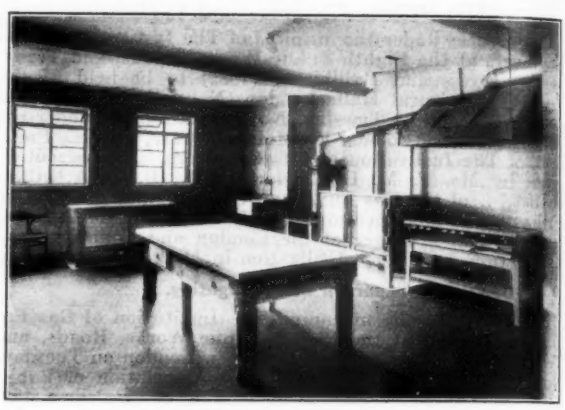
The New Building.

Gas Cooking for Modern Golf Club House

All golfers will envy Birkdale their new club house, which is the admiration of the golfing world. The authorities chose gas for their kitchen only after very close consideration of the claims of other methods of cooking and water heating.

Birkdale is a seaside golf course and the Architect, Mr. G. Tongue, of Southport, has designed a building admirably in keeping with its surroundings. Standing on the flat roof overlooking the Irish Sea it needs little imagination to feel that one is on the deck of a ship with ample space for deck tennis, &c. This new clubhouse has cost £10,000 to build and £2,000 to decorate.

The building contains a large smoke-room, a billiard-room, a card-room, and an extensive and handsomely furnished dining-room. Here in the most modern of all golf clubhouses the kitchen equipment is gas heated, and the Southport Corporation Gas Department has been responsible for supplying and fixing all the cooking and water heating appliances. One of our illustrations shows an exterior view of the new clubhouse taken on the opening day, and the other a corner of the all-gas kitchen showing some of the equipment. This includes a Richmond (Radiation Ltd.) double-oven range in grey mottled porcelain enamelled finish and mounted on a 12-in. stand to reduce stooping and leave the floor clear for cleaning beneath the ovens. Fitted beside the range and under the hood is a Richmond 6-burner boiling table fitted with a separate two-burner grilling compartment. This apparatus, and also the Richmond gas-heated hotcloset and carving table are both in enamelled finish. The installation includes a water boiler for teas.



The Kitchen.

Association of Public Lighting Engineers

The following have been elected to the Council of the Association of Public Lighting Engineers:

J. H. Clegg, M.Inst.Gas E., Engineer and Manager, Corporation Gas Department, Southport, and

C. I. Winstone, Chief Lamp Inspector, Gas Light and Coke Company,

in the place of

C. S. Shapley, M.I.Mech.E., M.Inst.Gas E., Engineer and General Manager, City of Leeds Gas Department, and

Alexander Forbes, Public Lighting Inspector, City of Aberdeen,

both of whom retired by rotation.

Novel Demonstration at Rochdale.

Film Display Included.

Mr. C. H. Bamber, the Gas Engineer at Rochdale, has recently broken new ground in regard to cookery demonstrations.

In order to increase the interest of the public, he arranged to have a film display which lasted a total of 35 minutes. This was commenced just after the demonstrator had prepared the food and placed it in the oven.

The first film shown was an ordinary film of general interest, while for the second he used the Radiation film, "What the Chefs Saw," which is a musical production, very bright and entertaining. Following on this was a humorous cartoon, and after this it was time for the demonstrator to remove the food from the cooker and conclude her demonstrations in the usual way.

The results of the display were in every way satisfactory, and Mr. Bamber has no doubt whatever that a larger number of people were attracted because of this novelty than would have been the case had the demonstrations been on the ordinary lines.

Standard Methods for the Sampling and Analysis of Coal and Coke

In accordance with the usual procedure the Coal and Coke Technical Committee of the Chemical Division of the British Standards Institution have just circulated to interested organizations and to the Trade Draft British Standard Methods for the Sampling and Analysis of Coal and Coke for Short Period Tests on Industrial Plant and Other Appliances. This new draft standard deals comprehensively with a subject which has been a perennial source of trouble in the past.

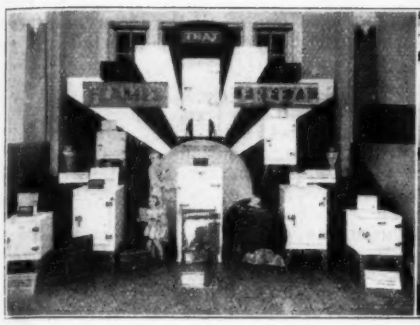
The specified methods are a development of the standards which have been previously issued by the Institution for the commercial buying and selling of coal and coke, and are based on the results of research which has been carried out by members of the Committee. The methods of sampling and the treatment of the sample have been so developed as to bring clearly before the user of the specification the effect on the accuracy of the variation in the weight of the sample.

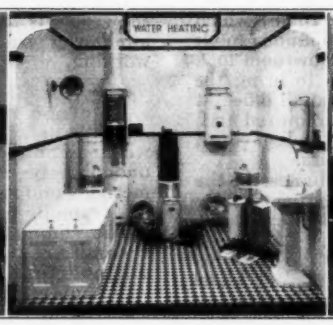
A table is included setting out the minimum weight of gross sample for maximum errors of ± 0·25%, ± 0·5%, ± 0·75%, and ± 1%. Very close details are specified for the method of collection and for the method of reduction, and full particulars are given in an appendix of a number of suitable forms of riffles or sample dividers. The draft standard methods give full particulars of the methods of analysis of coal and coke, together with standard methods of reporting the results.

A new feature of interest is the introduction of a test in the Coke Section for the determination of the thermal value of the volatile matter, in addition to the usual determination of the percentage of volatile matter. The draft Specification will, in accordance with the usual arrangements, be reviewed in five or six months' time, in the light of the criticisms received, and further modifications may then be made prior to its adoption and issue as a British Standard. Copies of the draft specification under reference (CD 7224) may be obtained from the British Standards Institution, Publications Department, 28, Victoria Street, S.W. 1, price 2s. 2d. post free.

Fine Gas Display at Cheltenham

The accompanying photographs, kindly forwarded to us by Mr. A. L. Morris, Accountant and Sales Manager of the Cheltenham and District Gas Company, give some glimpses of the excellent display staged by the Cheltenham Company at a recent local "Better Homes Exhibition." The comprehensive nature of the exhibit is evident from the photographs, and Mr. Morris informs us that not only was considerable interest created by the gas display, but excellent business was obtained.





"Sale" Records Broken Again at Newcastle

At the 14th annual "Sale" of the Newcastle-upon-Tyne and Gateshead Gas Company, queues began to gather at 7 o'clock in the morning of the opening day to take advantage of special opportunities offered to the public in the form of bargains, concessions, and free hire offers of labour-saving gas appliances.

The "Sale" is carried on at all showrooms of the Company for a period of two weeks. Consumers are offered first quarter's rent free for cookers, fires and water heaters, and a rebate of one quarterly payment is made on all appliances supplied on hire-purchase terms. A 12½% discount is allowed on all new cookers, fires, &c., purchased. Re-conditioned and shop-soiled appliances are sold at bargain prices. This year the Company issued a special illustrated four-page "Gas Company's Sales News" made up in newspaper form dealing entirely with the "Sale" and their new "Domestic Tariff" and distributed some 45,000 copies in their area. This publicity was backed up by poster, Press, and cinema advertising.

The orders secured constituted a record, amounting to 4,452 gas consuming appliances, which, together with non-gas consuming items, brought the total to 11,253 items disposed of at the "Sale." The total cash value of the orders also constituted a record, amounting to £11,016. The number of orders secured for gas water heaters was doubled at this year's "Sale." Although an inducement of "Free hire—1st Quarter" was made to quarterly consumers for gas cookers and fires, it is of interest to note that 6½ times as many orders were received for cash and hire-purchase of these appliances as against simple hire.

Athletic and Social

Mid-Southern Utility Co-Partnership Scheme.

In the course of his address the Chairman, Mr. R. W. Edwards, at the Annual Meeting of the Co-Partnership Scheme and the Hospital and Benevolent Fund of the Mid-Southern Utility Company said that he was particularly glad to see the increased use which has been made of the Savings Fund during the past year. Members had put by £3,318, and the total passed through the account since the scheme began had now reached the splendid figure of over £25,000. The Long Service List now contained 53 names, and covered periods ranging from 20 to 53 years, which was a further illustration of the happy relations existing throughout the Company.

It was pleasing to know that the Hospital and Benevolent Fund was so generally supported by the employees, and the Chairman emphasized that the Directors would not hesitate to supplement the employees' subscriptions to such an extent as might from time to time be required in order to sustain the Fund in its present state of healthy benevolence. The Sports and Recreation Club continued to progress and the Athletic Sports Meeting in the earlier part of the year proved a great success.

Foster & Pullen Staff Outing.

Blackpool Illuminations were visited on Saturday, Oct. 19, by the employees of Messrs. Foster & Pullen, Ltd., of Bradford. Motor coaches conveyed the party to Blackpool where high tea and supper were provided at the Grand Hotel. The Managing Director, Mr. H. R. Stevenson, was accompanied by Mrs. Stevenson. In the course of his reply to a vote of thanks for a most enjoyable outing, Mr. Stevenson said he welcomed the opportunity provided by this happy gathering of thanking each and all for their splendid willing co-operation. This spirit reached the customer in the form of "Service" which had resulted in a gratifying increase in turnover during recent years. The results of the increased business last year had justified a large extension of plant now nearing completion. Mr. Stevenson concluded by thanking those who had, in good fellowship, given their services in connection with the outing and expressed the hope that the number of employees would continue to increase.

Blackburn Social and Benevolent Club.

At the annual party and prize distribution in connection with the Blackburn Corporation Gas Department Social and Benevolent Club, on Oct. 19, Mr. G. Beardwood (Secretary), reported a membership of 230. Councillor R. R. Fielding (President, and Chairman of the Gas Committee) presided, and Alderman W. Kenyon, Deputy-Mayor, presented prizes to the following: Hamer Bowling Cup, Mr. W. Duckworth (winner for second year in succession), Knock-out competition, Mr. A. Mitchell's team. Cricket batting and bowling, Mr. F. Slater (second successive year), and, Fielding Tennis Cup, Mr. J. Barton.

MANCHESTER DISTRICT ASSOCIATION

Meeting Present Day Conditions

by C. BATEMAN

In this Paper, which he read before the Manchester District Association of Gas Engineers at their Meeting in Manchester on Oct. 18, the Author gives details of some of the Harrogate Gas Company's activities during the past two years.

A good deal of thought has been given to the various showrooms of the Company. The main offices and showrooms are situated in the centre of Harrogate on an excellent site, and therefore it was only necessary to consider the re-arrangement of the interior of the showrooms.

The main showroom is 33 yds. long and 9 yds. wide, and had offices half-way down the length of the room, which projected to the extent of 6 ft. This, in my opinion, spoilt the approach to the counter, and made the showroom look infinitely smaller. It was, therefore, decided to bring the counter forward a matter of 3 ft. and put a small office at either end. This gave all the accommodation required and, at the same time, opened up the showroom and gave an uninterrupted view of the whole of the exhibits.

I have endeavoured in re-arranging the appliances in the showroom, to keep the various departments entirely separate—*i.e.*, a portion for cookers, water heaters, fires, lighting, and a coke exhibit and coke fires. This is an important factor, and I am sure is beneficial to the purchaser. Instead of seeing a whole mass of different kinds of appliance, he can go straight to the particular section he wishes, and see a choice of, say, half-a-dozen cookers. Then, if he wishes to have a different type of hotplate on the cooker, or decides on a certain type of fire but wishes to have a different colour, he can visit a further showroom in the basement where it is possible to see a whole range of appliances, my main object being that the consumer is originally shown a minimum number of appliances, in order that a choice can be more easily arrived at.

As everyone knows, good showrooms are absolutely essential, and in my own particular district where six smaller undertakings have been absorbed, spread over an area of 200 square miles, it is obviously necessary to have district showrooms as well as a showroom in the centre of Harrogate. Showrooms have been in existence at Pateley Bridge and Boroughbridge for some time, and it was decided that the other districts should be similarly served.

The first district to be dealt with was Knaresborough, and suitable premises were acquired in the High Street. As this was very old property complete reconstruction was necessary. This meant an entirely new front, and it was finally decided to have this on modern lines with an attractive façade carried out in black opal glass and chromium plate. It is lighted from the inside, and at night produces a brilliant neon effect.

The ground floor of this showroom is equipped as follows: An ebonized counter relieved by stainless steel decorative bands stands out against primrose walls and a polished oak floor. The gas fire is an " Inlae " in stainless steel, fixed in a black armoured opal surround, having a stainless steel plinth.

The space behind the counter is equipped as an office for the salesman in charge.

The first floor is equipped entirely as a showroom for demonstrating hot water appliances, and the display of fires and lighting fittings. All lights are controlled by switches, and all fires have the new automatic lighting arrangement operated by turning the gas tap.

Another showroom has been equipped at Boston Spa and it is hoped in the near future that both Wetherby and Tadcaster will be served in a similar manner.

With regard to window displays, apart from the straightforward exhibition of the appliances for sale, an endeavour is always made to link up with any event of local interest, for example, August was widely advertised as being Harrogate Polo Month, polo being played on the Stray during the whole of the month, and in this case a suitable window display was evolved, which proved to be very popular indeed. It caused a good deal of attraction, and very favourable comments. In fact, at the end of the month we were asked to display the 50-guinea trophy which was awarded for the winning team, which, of course, created a further interest.

At the same time, I think the entrance to a showroom should look as inviting as possible, and here again, although perhaps only a small matter, we have introduced something novel in the way of a page boy. The page is always in attendance at the door in a smart uniform, and is very much appreciated by consumers visiting the showrooms.

One other point which I am convinced is essential in a showroom is, that at least one of all the different types of appliances shown must be actually connected up and working.

Sales Policy.

Going on from showrooms to sales policy, this is a matter which is now occupying the minds of most of us, and is undoubtedly of paramount importance, and some of the methods adopted in Harrogate, although I am fully aware are probably not new, might be of interest.

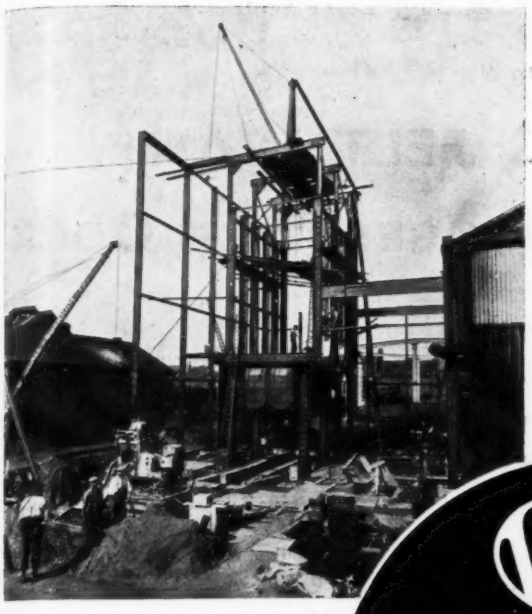
The elimination of the old black cooker is, of course, generally realized as an essential policy, and for some considerable time we were spray painting these cookers to give what appeared to be an enamelled finish, in order to satisfy the consumers with regard to the appearance. This

method is, in my opinion, far from satisfactory, and it is essential that cookers treated in this way must be repainted from time to time. This is a tremendous expense, apart from the inconvenience caused to the consumer, and at the same time is not really a satisfactory job, but the main disadvantage is that where these cookers are supplied in connection with a prepayment meter an open field is left to electrical competition. There is nothing to prevent a consumer asking for his old cooker to be removed at any time. This happened in several cases, and when enquiries were made it was found that an electrical canvasser had called on the consumer and pointed out that an enamelled electric cooker could be had on simple hire at the following rates: 4s. 6d., 5s. 6d., or 7s. 6d. per quarter. This was for a small, medium, and large sized cooker.

As a matter of fact, the small cooker at 4s. 6d. was too small to be of any use, and was later withdrawn.

In order to combat this, a modern enamelled cooker was selected as being the standard cooker for prepayment consumers. All these consumers were circularized with a pamphlet stating that this cooker could be purchased out of rebate over a period of seven years at the rate of 5s. 6d. per quarter, this being the same charge as the electrical undertaking made for the simple hire of the medium sized cooker. It was pointed out to the consumers that at the end of the seven years they had the additional advantage

IN COURSE OF CONSTRUCTION



Construction in progress on an installation of W-D Continuous Verticals for Loughborough Gas Dept.

W-D Carbonising Plants at present in course of construction will, when put into operation, be capable of carbonising a total of over —

2,700,000
TONS OF COAL PER ANNUM

WD
Carbonising Plants
W-D Continuous and Intermittent Verticals
W-D Becker Ovens

An installation of W-D Continuous Verticals put into service recently for the Exmouth Gas Co.

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THIS COCK WILL REMAIN SOUND *and* EASY FOR LONG PERIODS

AN EASY TURN PLEASES YOUR CONSUMERS

SAMPLES AND PRICES ON APPLICATION

that the cooker became their own property, and also that after that period, if they had no other appliances on hire from the Company, they would also get the advantage of the full rebate on gas consumed—*i.e.*, a total of 3d. in the 1s. At the same time, should a consumer wish at any time, the cooker is so made that it is only a matter of a ten minutes' job to fit a Regulo, and this is supplied at a cost of £1 5s., and again this can be purchased out of rebate. During the time the scheme has been in operation 872 cookers have been supplied to slot consumers.

While on the question of cookers, the results of a recent investigation might be of interest. It was obvious, of course, that when new cookers replaced those of an older pattern, the equivalent duty of these appliances would be done with a reduced gas consumption, and as this has very often been quoted, I carried out tests in order to find out exactly what the difference is.

The amount of food taken for these experiments was exactly the same in each case, and was taken to represent a normal meal for four persons. The meal consisted of:

Sirloin of beef . . .	2 lbs. 14 ozs.
Potatoes, baked . . .	1 lb.
Yorkshire pudding . .	4 ozs. flour, two eggs, salt, ¼ pint of milk
Apple tart	Short pastry crust, 2 lbs. of apples and sugar

Several tests were done on each type of cooker and the consumptions given are the average in each case.

The first cookers to be tested were some of the older patterns of black cooker being returned from the district, and these cookers showed that it required on an average 41·5 cu.ft. in order to cook this meal.

For the next experiment a modern cooker was taken, but not of the more expensive type, having combined top and bottom flue outlet but not fitted with a Regulo. In this case the average consumption to cook the test meal was 35 cu.ft.

For the third test a modern cooker was taken and in the first case the Regulo was not used, the whole of the cooking control being done by the tap, and this gave an average consumption of 25 cu.ft. In the last case a No. 2 New World cooker was used, but this time using the Regulo control, and the average gas consumption was only 17·5 cu.ft.

The two extreme consumptions—*i.e.*, 41·5 and 17·5 cu.ft.—are certainly worthy of note, and it will be seen that where the old cooker (and again I emphasize the question of the extreme cases) is replaced by a modern cooker the gas consumption is reduced by 58%.

When serious competition started with the electrical cookers, as I stated previously, it was due mainly to electrical canvassers approaching prepayment consumers and getting an agreement signed whereby the consumers undertook to retain the cooker for a period of not less than two years. A careful record was kept where these cookers were installed, and just before the two-year period expired a canvasser called on each of these consumers, and in many cases was successful in again installing a gas cooker.

Cooking at a Hospital.

While on the question of cooking I think perhaps some information with regard to the New General Hospital at Harrogate would be of interest to members.

In 1928 the erection of a new General Hospital for Harrogate was commenced, to replace a building which had become too small for the requirements of the district. The cooking facilities in the old building were by gas and the scheme as originally drafted by the architects provided for a gas kitchen in the new building and a 3-in. gas supply was laid on.

On Nov. 30, 1929, my Company was informed by the Hospital Secretary that the Building Committee had decided, on the grounds of "efficiency, economy, and utility," to have the cooking done by electricity. Every effort was made to get this decision rescinded and data were given to the Hospital Authorities refuting the claims made for electricity. Details were submitted of other hospitals where electrical installation had been scrapped, and figures supplied of costs in similar institutions, but to no avail.

The catering is carried out in the main kitchen and in six ward kitchens. The cooking proper is done in the main kitchen, and teas, hot drinks, &c., are served from the ward kitchens. The hospital authorities were becoming concerned with the running costs of the electrical installation, and I might mention here that electrical breakdowns had caused considerable inconvenience on several occasions, and particularly on one occasion during the heavy snows of February, 1933, when the supply failed for the greater part of the day, and the cooking for 200 people had to be carried out as best possible on the two small gas cookers.

In March, 1933, we were asked to quote for a gas supply from the meter into the main kitchen, with the idea, I believe, of having a large stand-by gas cooker available for emergencies. The order, however, was not given to carry out this work.

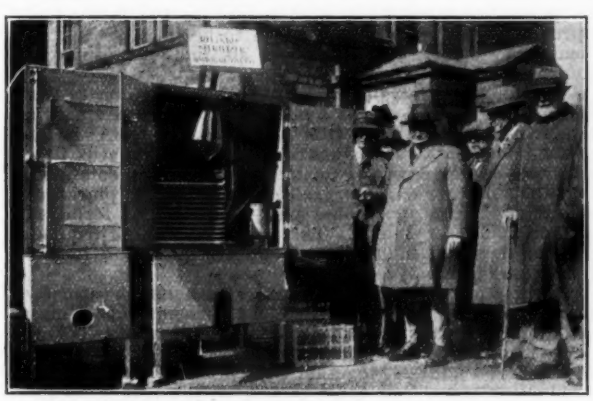
At this time, every effort was made to show the great economy to be effected by the use of gas, and my Company in August, 1933, offered to supply on hire the complete equipment of one ward kitchen, to comprise a water boiler, and a modern cooker, and to fit a separate meter to enable a direct comparison to be made with an exactly similar kitchen fitted with electrical apparatus, which for the purpose of the test was also separately metered.

The results of this test were so satisfactory that in October of the same year the Company was invited to submit an estimate for converting the remaining five ward kitchens to gas operation.

In December of that year I met the Hospital Committee and discussed the possibility of going over entirely to gas for cooking purposes.

To contemplate scrapping in such a short time electrical apparatus which stood at a cost of some £600 was a very serious matter, and a strong case had to be made out for gas.

Under the heading "Comparative Costs" I was able to point out, in a manner which could not be ignored, the potential economies in actual money value. Comparisons of gas consumptions and costs in different institutions were placed before the Hospital Authorities.



Gas sterilizing equipment on show to farmers. A potential load which is being explored at Harrogate.

While realizing that it was treading on dangerous ground, I gave an estimate of the annual consumption of gas, and the running cost of the scheme, as put forward, was adopted. Although on current prices the operating costs were greatly in favour of gas I was pressed to give special terms. After careful consideration, and in view of the fact that the Hospital is a public charity, my Board decided to offer a special contract, subject to a minimum annual consumption. Under the terms of the offer gas was to be supplied at a rate of 7½d. per therm, less 10% discount for a minimum yearly consumption of 7,000 therms, and this was accepted in May, 1934.

The fact that the new Hospital equipped with the latest electrical cooking apparatus has scrapped these and installed gas appliances has had a psychological effect throughout my area of supply, and has no doubt helped indirectly in retaining and increasing our business.

I give a summary of facts and figures appertaining to this case.

	s.	d.	
Price of electricity, as supplied to hospital .	0	0·607	per unit
Standard price of gas, as taken for purpose of test on ward kitchen	0	8·1	per therm
Cost of running electric ward kitchen . . .	1	7·11	per day
Cost of running gas ward kitchen	1	1·23	,,
Saving	0	5·88	= 30%

Comparison of Twelve Months' Cost.

	£	s.	d.
Hospital: All electric— Consumption, 174,474 units at 0·607d. . .	441	5	6
Hospital: All gas— (12 months ended Sept. 30, 1935) 7,946 therms at 6·525d.	216	0	7
Saving	£225	4	11 = 51%

	d.
Average cost of gas per head per day	0·709
Previously, average cost of electricity per head per day	1·451

In fairness, I should point out that two steam jacketted pans and one steaming oven were installed, operating on

live steam from the main boiler, whereas previously, this work was done by electrically heated apparatus.

Against this, extra gas points were provided in the workshop, for a coke fire, and for sterilizers.

It can be safely said that cooking for an Institution of this size can be done for ¾d. per person per day, with gas at the price of 6·525d. per therm.

Before leaving the subject of competitive fuel I should like to mention another great field of potential gas consumption. The actual consumption of house coal during the past few years is not available, but it may be taken on very good authority that 40,000,000 tons per annum can be considered an accurate figure.

Here is a great field for gas in competing with solid fuel for heating and cooking. There are numerous cases of potential gas consumption which could still be gained on the grounds of cleanliness and economy, as opposed to a solid fuel, but to make gas really competitive, on economical grounds alone, I strongly favour the introduction of a gas tariff whereby a fixed charge per annum is made on some sound basis, and the gas is sold at a price which can compete with solid fuel for all domestic purposes.

With regard to sales policy, it is impossible to say that any one particular scheme is the only method to adopt, and the sales policy must be, of necessity, built up of various methods of approach to the consumer. The most successful of these is, in my opinion, actual contact with the consumer by a canvasser. In Harrogate this department has been recently augmented and canvassers trained for this particular work both with regard to the method of approach to the consumer and also to be in a position to discuss the comparative costs of all fuels for different requirements.

Personally I do not believe in paying commission to this class of man, and in my case all the canvassers are paid a standard remuneration, with no commission. A bonus scheme, however, was inaugurated some 18 months ago, and every employee of the Company, apart from salesmen, is eligible to partake in this scheme. Boxes are placed at various convenient positions containing printed forms of "introduction for sales." This scheme does, of course, apply more to meter inspectors, and the like, than to any other class of employee.

Assuming a Meter Inspector calls at a house, he usually has an opportunity of seeing some of the rooms, and it may be that there is the possibility of the sale of a new cooker. His instructions are, not to try to effect a sale, but to put the name and address, together with his own name, on his introduction form, and hand this in on his return to the office, with a note of what appliance might be sold. A canvasser then calls the following day, on the information that there is a possibility of a sale at this address, and, should he be successful, the introduction form is then completed, stating that the sale has been effected, and the value of same. At the end of each quarter the total sales for each employee are ascertained and a bonus of 1% is paid to the person who originally introduced the business. The results obtained from this scheme have justified its existence, and since its introduction the total sales have amounted to nearly £9,000.

A new gas load has been created, although perhaps small, on account of the Accredited Milk Scheme recently introduced by the Milk Marketing Board. As a matter of fact this is a big step towards raising the national standard of milk production.

To become an Accredited Producer and qualify for a Grade A licence a producer's herd is clinically tested, his premises are examined, and must conform to certain standards with regard to cleanliness, good floor and drainage, ample light and air space; the milk is sampled and examined for bacterial count. The dairy must be separate from the cowhouse. It must have plenty of light and a concrete floor well drained. A sterilizer must be installed in order to cleanse thoroughly all milking appliances.

On and after May 1, 1935, an Accredited Producer who sells his milk through the Board receives a bonus of 1d. per gallon. This is a financial inducement to farmers to take out a Grade A licence and supply uncontaminated milk from healthy cows.

Some idea of this potential load may be estimated as follows: A gas heated sterilizer will consume about 80 cu.ft. per hour. It will be used for, say, three hours a day and seven days a week. The annual gas consumption will be in the region of 87,000 cu.ft.

All producers of Grade A quality milk must sterilize their utensils and milking appliances.

In my case a special salesman has been allocated to deal with this new load who is familiar with all the regulations and conditions relating to Grade A licences so that he can answer any question a farmer may put to him. It will also help a great deal if the salesman is able to discuss intelligently milk production, handling of milk, cleanliness in dairying, &c. H.M. Stationery Office publish a number of Bulletins and advisory leaflets which are well worth studying by any prospective canvasser.

The local Sanitary Inspector and Veterinary Officer can be very helpful in giving a list of all farmers and dairymen who supply milk in the locality. The Secretaries of local Farmers' Clubs and Dairymen's Associations can also be of assistance in supplying lists of milk producers who perhaps have farms in the district and supply outside the locality.

Demonstrations have been given in all parts of my area of suitable gas operated sterilizers. These were actually demonstrated on market days in the various towns, and a good deal of interest was shown. The sterilizers were connected up to an ordinary street lamp and shown actually in operation with churns and bottles in the sterilizers.

Home Service Department.

An endeavour is being made to create a new department and although this has only been in vogue a comparatively short time it has met with no small degree of success. This is called the Home Service Department. At the present time this work is carried out by a member of my technical staff, in connection with other duties, but I hope that in the near future it will be sufficiently popular to keep one person fully employed.

All members of the Company have been instructed to mention this Home Service Department to consumers wherever possible, and to tell them that when they are

The demonstration room of the Harrogate Gas Company. Note the large dial which indicates the cost of the cooking in progress.

contemplating a new house, or the re-arrangement of the kitchen, or an additional appliance in the house, or even only fitting a gas fire, if they will let us know, the Company will give them a complete coloured drawing of their requirements. I have found this arrangement most successful with consumers.

Cookery demonstrations are also given to the public and take place on two afternoons every week in our Harrogate Demonstration Hall, apart from hiring halls in outlying districts, where the Company's showrooms have not sufficient accommodation for this particular work.

The demonstration room in Harrogate is capable of holding 150 people and the demonstrator's platform, which is 16 ft. by 8 ft., is fully equipped with all appliances.

You will see from the illustration shown that the meter used in connection with the demonstrations has an enlarged dial with a pointer. The dial has been calibrated in farthings, so that members of the public can see for themselves the actual cost of cooking whatever is being demonstrated. This can also be checked from the ordinary dial of the meter by direct reading in the ordinary way.

You will remember from the previous figures—*i.e.*, using a New World cooker with a Regulo control—that a very low consumption is obtained when cooking a normal meal for four persons. This, when carried out in the demonstration room, has never registered a cost of more than ¾d. for gas at the present prices in Harrogate.

These demonstrations are varied from time to time, and an address delivered to the women on Cookery, Housewifery, Dietetics, Laundry, &c.

Evening instruction classes in cookery for business girls are also held once a week. All offices and shops employing girls are circularized, and as a result 120 students have been enrolled. A complete syllabus is drawn up showing exactly what will be done each week, and the classes run from Oct. 1 to March 31.

The Labour Exchange and Employment Bureaux for domestic servants have also been approached and in many cases advantage has been taken of the opportunity to give instruction to people on the Register in plain cooking, &c.

This was found to be helpful to these people in obtaining situations.

In March, 1934, I decided to form a Women's Gas Development Association in Harrogate. This Association has now a membership of 120, and from my experience I am quite convinced that the amount of work put into its formation, and consequent running, has been well worth while, and now that a Women's Gas Council has been formed, I am sure it is a scheme which will be of tremendous value to all undertakings.

Incidentally, at all our meetings a reporter is present and details of our activities appear in the local Press. Here again this is excellent and cheap publicity.

In conclusion, and before showing you the film I made nearly two years ago, I think a few particulars of how the showing of the film is arranged will be of interest, especially in view of the recent introduction of propaganda films by the British Commercial Gas Association.

This film is shown for a week at a time in six different cinemas in my area of supply, and for this period, if the seating accommodation were fully occupied, this propaganda would be presented to 31,800 people. Allowing for an average of, say, 50% attendance, this would be 15,900 in six weeks, the total cost being only £9 11s. This, in my opinion, is very cheap, and an excellent method of advertising, as I am sure that it has a definite appeal to the public, as compared with some of the more usual methods.

Discussion.

The PRESIDENT said Mr. Bateman came to Harrogate from the Bath Gas-Works, and anyone who had examined the accounts and the number of appliances in use in the Bath area would understand that he had brought to the sales side of the Harrogate Gas Undertaking something entirely enterprising. Not a single phase of salesmanship had been left unexplored. The figures for cooking by gas and cooking by electricity were very interesting. The film was unique and showed great enterprise on Mr. Bateman's part; it should be most excellent propaganda and could be easily copied in other areas.

Col. W. M. CARR (President of The Institution of Gas Engineers) said he appreciated the kind welcome accorded to him, but he could not feel that he was a visitor; he was a Past-President of the Association and a member for more years than he liked to count, and he felt that he belonged to it. He was at home there. The comparisons published in the Paper were invaluable. From the point of view of selling nothing was more important than to secure figures on an authentic basis, under actual working conditions, that could be given in comparison with competitive fuels. Mr. Bateman had given valuable information about the comparative costs of cooking with gas or electricity in the new hospital at Harrogate. He ought to be congratulated upon his tenacity in selling gas to that hospital. He did not accept defeat, but through his persistence that which was economically the best prevailed in the long run, and his example should be an inspiration to all of them. The consumption of 40 or 41 cu.ft. was given for cooking a dinner on the black cooker. Was it a packed or an unpacked cooker? If it was a packed cooker Mr. Bateman might tell them something about the condition and nature of the installation when the test was made; because the difference was rather greater than most of them had experienced when endeavouring to get similar figures of comparison between black cookers and, say, all-enamelled cookers. He felt with Mr. Bateman that while they lost a considerable amount of consumption by automatic oven control they should spare no effort to get it universally adopted. The greater the economy they could show in gas cooking the more did they consolidate their position that gas was the most economical and convenient means of cooking available to the public of this country. For that reason, at Stretford they did not buy or supply new cookers that had not automatic oven control. If all gas engineers adopted that principle they would effectively prevent electricity from encroaching in the cooking field.

Continuing, Col. Carr said that Mr. Bateman introduced a most important point when he indicated that if they were going to get an additional load it would be at the expense of solid fuel. He also indicated the desirability of adopting a two-part tariff combining a fixed charge and a low commodity cost. That low commodity cost should be primarily fixed on the basis of competition with solid fuel, and it would vary in different parts of the country. In the Manchester area he thought from 3½d. to 4d. was a price at which they could get continuous heating—certainly water heating—that would compete with solid fuel. In London and the south, of course, the price would be higher. In fixing any tariff the basis of consideration should be as to what was the price at which gas must be sold at if the additional load which was available was to be secured. A tremendous field could be opened up by the introduction of competitive prices. In many instances they would have to start with a fairly high fixed charge to enable them to introduce a commodity cost which was going to compete with solid fuel. It was better to do that than start with a high commodity cost and a low fixed charge.

They all congratulated Mr. Bateman upon the work he had done in the Women's Gas Association, his film publicity, and in setting up Home Service within his organization. Films were very much in their minds at the present moment, and the question had been receiving the attention of the B.C.G.A. One did not wish to be too critical in the early stages of a development, but he thought many felt that the films produced would have been more effective as propaganda if they had been directed to indicating the utilization of gas and the advantages of utilization, rather than to showing, in some instances, retort house practice which many gas engineers looked upon as being rather antiquated and methods of loading governors which had long since ceased to operate. To indicate in a modern film intended for propaganda methods which were obsolete long ago was definitely wrong. He thought the B.C.G.A. would be able to correct those defects and would see their way to producing films more indicative of the business that was being secured and the uses to which gas was being put. That would provide much better propaganda.

Modernizing Old Cookers.

Mr. F. G. SHAW (Buxton) said he was particularly in agreement with Mr. Bateman in regard to the question of the modernizing of old cookers. He had expressed in another place his opinion as to how best that could be done. There was no answer to oven development in electrical practice except by the most economical gas oven that the Gas Industry could produce. Speed of operation was most important, particularly in connection with the hot plate. The hot plate offered to the public by the Gas Industry was, in his opinion, much more efficient than the electrical device, and that advantage should be fully maintained. With regard to oven consumptions, the figures stated by Mr. Bateman were really the first indication of tests which showed how remarkable was the economical working of the modern cooker as contrasted with that which was placed upon the market even ten years ago. The only answer as to what was to be done with the old cookers was the sledge hammer. They might as well face this truth boldly, because the concentration of the electrical industry on the domestic cooking load was becoming keener every day. This point required emphasizing, because a great many of them were very reluctant to scrap what appeared, superficially, to be a satisfactory article.

Mr. C. R. INGHAM (Brighouse) said they had been informed that the old type of cocker required 45 cu.ft. of gas to do the same work as the modern cooker would do with 17 cu.ft. Had Mr. Bateman any figures to show whether the consumption with a new cooker was less than with the old cooker? Personally, he did not suppose there would be much difference. He thought the modern cooker was an article the consumer would be delighted to have and of which he would make more use.

Mr. W. B. MCLUSKY (Halifax) said Mr. Bateman had shown that the gas supply section of the Industry's business was not yet fully explored in most undertakings. He had been most successful in his efforts to meet the requirements of a purely residential area which did not present the same range of opportunities as were available in the case of industrial areas.

Mr. H. DAVIES (Chesterfield) said it was necessary to experiment in order to appreciate the fundamentals of present-day conditions. He had, personally, carried out experiments with a modern up-to-date gas cooker such as could be sold on hire purchase to gas consumers, and also with a cooker which could be let out to consumers at a reasonable rent of 3s. 6d. per quarter, and with the most up-to-date cooker obtainable. The experiments were carried out for the period of a week and dealt with breakfasts, dinners, and teas. The services of a lady cookery expert were enlisted, who had had experience in both gas and electrical cooking, as well as those of an expert from the Birmingham University in conjunction with the staff of the Chesterfield Gas Department. Data were collected with regard to gas consumptions, periods of times for consumptions, and costs, and the information obtained was published in pamphlet form and circulated to Chesterfield consumers generally. As the result, the consumers had been very favourably impressed with the advantages of cooking by means of gas. Furthermore, two members of his staff had been permitted by the Gas Light and Coke Company to study over a period of six weeks the methods and principles of salesmanship of that great organization. As a result of their report ten men had been appointed to deal with gas-consuming work in Chesterfield, and the number could be doubled with advantage. He was very proud of the showroom at Chesterfield, which had been evolved as the result of much patient enquiry all over the country. The chief difficulty had been to persuade the public to visit it, although there were excellent demonstration rooms and competent demonstrations on the staff. Probably something on the lines that Mr. Bateman has shown would attract the public to the showroom, as there was plenty of accommodation for exhibiting screen pictures.

Competition from the Modern Coal Range.

Mr. J. H. CLEGG (Southport) mentioned that during his past few years' experience he had not found electricity to be a very serious competitor in respect of cooking, even though electricity was sold at a fixed charge of ½d. per unit and on a flat rate basis of ½d. per unit all in. He was more concerned with the development of the modern coal grate. He had recently spent a considerable amount of time in inspecting new houses of a value varying between £600 and £5,000. In a dozen of those houses not a single gas pipe was installed, although the gas service was laid on, while in the kitchen there was a modern coal grate. Electrical ovens did not appear to be making much headway. The introduction of the two-part tariff two years ago was definitely not a success. It was based on a fixed charge

of 6s. 6d. per room per annum with a minimum charge of 30s. A nine-roomed house would approximate about 13s. per quarter with a commodity charge of 4d. per therm. The only people who would go on this system would be people who could save money. In the first year there were 50, in the second year there were another 50, and in another year those consumers only increased their consumption to a small extent—perhaps 20,000 cu.ft. He had found that the payment of commissions had been very successful. About six years ago he introduced commissions to workmen, and the amount of business they produced during the first two years was enormous—amounting to about £5,000. Even the office staff brought a large amount of business. An office boy earning 15s. a week sold six cookers in his spare time, for which he drew as much commission as the amount of his weekly remuneration. He could well imagine, however, that in a residential area like Harrogate, which was mainly composed of well-to-do people, canvassing by workmen would not produce such good results as were possible in an industrial town.

Mr. T. R. Cook (Blackpool) noticed that Mr. Bateman did not say much about domestic lighting. He thought most of them had experienced a reduction in the consumption per consumer. Some two years ago a café in Blackpool installed electrical appliances throughout at an expenditure of over £1,400. One Bank Holiday they were so badly let down that they issued an order to install gas appliances, and it was ultimately found that the saving in expense amounted to over 50%.

The Author's Reply.

Mr. Bateman, in reply to the discussion, said that he had not with him the exact times of cooking, but he would publish them together with the consumptions. The old black cookers that were returned were in a very bad condition, and they were unpacked; but, on the other hand, regard should be had to the fact that there were many thousands of them out, and they should be replaced. There was no doubt that a certain class of consumer still asked for gas lighting purely on the grounds of economy. The lighting load should not be neglected. In the case of certain abnormally-sized artizan dwellings he had put on a separate meter for the lighting, and the average consumption was 8,000 cu.ft. per annum. This was an insignificant amount compared with the field that was open to gas producers if gas was sold on such terms as to bring their commodity charge to a low figure to compete with other solid fuels. With regard to sales of cookers to slot consumers, they were certainly in the nature of an insurance policy for consumers. An article on hire purchase for seven years in 99 cases out of 100 was retained for that period. There had been a considerable amount of discussion with regard to the comparative costs for cooking by gas and by electricity, and he was convinced that gas undertakings had nothing to fear in that direction.

Upon the motion of Mr. A. L. Holton (Manchester), seconded by Mr. R. N. Webb (Leeds), a very cordial vote of thanks was unanimously accorded to Mr. Bateman for his Paper.

COKE OVEN MANAGERS' ASSOCIATION

Presidential Address

by
T. WESTTHORP,
A.M.I.Chem.E.

Delivered at the Annual Meeting of the Association held at the Hotel Victoria, London, on Thursday, Oct. 24, 1935.

The Coke Oven Managers' Association is nearly come-of-age, and a few remarks in retrospect may be fitting. The period covered by the life of the Association has been an important one in the history of the Coking Industry and our relations with it, attempted and actual, have not been without significance.

Until the formation of our Association there was no common ground for intercourse between those engaged in the management and working of coke oven plants. The Coke Oven Managers' Association within the limits of its resources and by the stimulus of its own enthusiasm, has done much to raise the technical efficiency of the industry; the task is still an urgent one.

With regard to coke oven installations, following a lead given in 1924, steady progress has been made in their modernization. Larger ovens with high grade silica as the refractory material have become general where new batteries are being laid down, and a few of the older batteries have with advantage been reconstructed in silica. Regenerative types are invariably adopted in order that the maximum volume of surplus gas may be available.

There is still diversity of opinion as to the best width for an oven, but experience has shown that generally this is governed by the nature of the coal to be carbonized and the particular kind of coke required. At the time of writing several installations are under consideration for the North of England, which when completed will enhance the industrial importance of that area.

To advance its prosperity the Coking Industry needs the concentrated attention of all who are interested in it. The main requirements are extension of trade for the products of the coke oven and increased efficiency in plant and personnel. To deal directly with policy affecting the extension of trade is not the special business of this Association as a body; the improvement in plant, the products from it, and in personnel is. These considerations are indisputably interdependent.

The main avenue to advancement is investigation and direct research, and an essential preliminary must, therefore, be education. A complete education for a coke oven technologist cannot be easily defined, but that it should be broad and intensive admits no question. Almost every branch of applied science is involved in modern coking technology, therefore, it cannot be expected of any one individual to possess exhaustive knowledge in all.

In view of the requirements and relationships which modern industry has evolved perhaps the most important part of education is the general and truly fundamental one which enables those who are engaged in it to understand and appreciate each other's point of view. Success with daily problems is more likely to come along these lines than any other. These are matters constantly before the General Council.

Educational Facilities.

Our universities are to be congratulated on the excellent courses in fuel technology which they provide. It is a matter of regret to some of us that one important coalfield —*i.e.*, Durham, with coke oven plants capable of producing six million tons of coke annually, while possessing an excellent university, does not provide a comprehensive course in coal carbonization and chemical engineering, with facilities for post graduate research. This may be a matter for the future, but is worthy of comment.

The General Council regards with increasing importance the need for the specialized study of coal carbonization and its products, together with the engineering science involved, and is endeavouring to determine a qualification for entry to the Association based on such need. This entirely accords with the spirit of the times.

The importance of investigation and research cannot be too frequently emphasized. The subject has been, and continues to be, discussed by so many eminent authorities that it is with considerable temerity that I approach it. I am, however, encouraged to do so, by the earnest conviction that in properly directed research and investigation only, can we keep, much less improve, the position of the British Coking Industry. Research must now be regarded as a permanent part and requirement of it.

Too sharp a division between fundamental and industrial research should not be made. Members will have their own views as to what might properly be undertaken by universities and other specialized organizations, but I would urge that as much as possible be done by Coke Oven Companies themselves. They are the best judges of their own requirements and should have competent staffs and equipment to carry out technical investigations and control work. There is abundant evidence to show that it pays. This arrangement may present difficulties to small companies; for these the alternative would seem to be joint research controlled by and for themselves. Few companies could remain disinterested in such procedure were it inaugurated.

By its very nature the Coke Oven Industry must ever be in a state of flux. There can be no finality to the number of its products. When any combination ceases to be profitable by reason of over production or reduced trade, then that combination must be varied or new uses found for the products. To declare this task is much easier than to discharge it. The problem requires adequate research; and co-operative research may well prove to be a valuable

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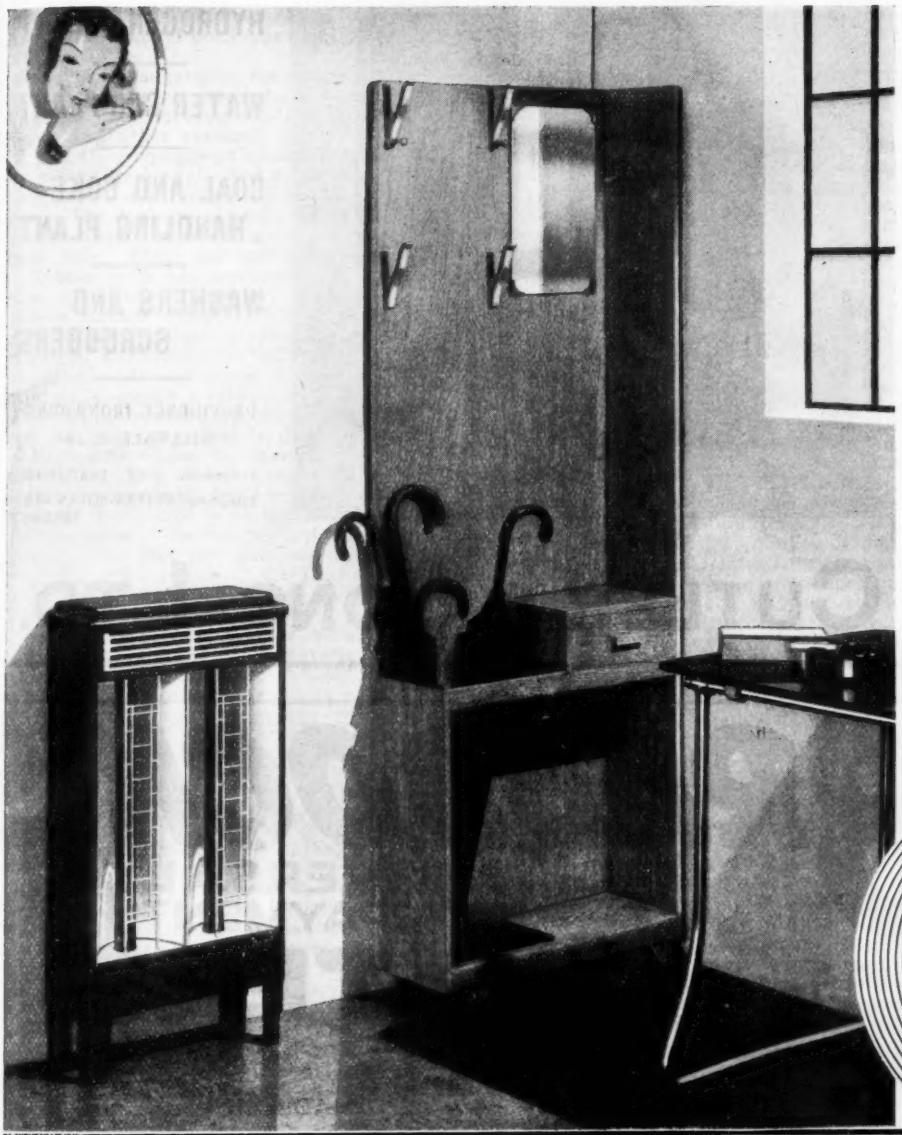

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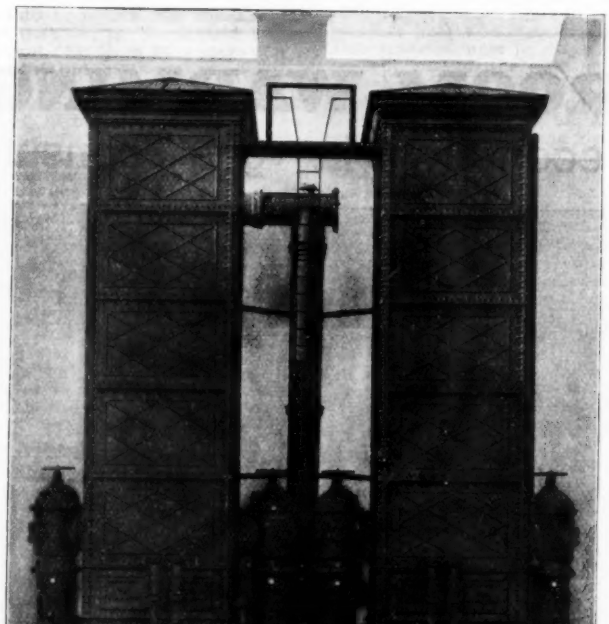

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method to its solution. Information to be of practical value should be obtained on plant approaching full scale. This as conducted at present renders progress very slow and spasmodic, and generally gives rise to temporary scepticism, justified or otherwise, always resulting in delay. A joint research establishment would do much to remove these difficulties. The financial and other equally important factors which are involved in such a project should not be insurmountable. The technical personnel of our industry has already shown what it could do in times of national crisis. The best utilization of our coal resources being a fundamentally permanent requirement to the well-being of this country and never more pressing than the present, a statement of the considered views of this Association should not be unwelcome to those whom it concerns.

In stressing the suggestion for such an establishment the good work done by the several coke research committees, the National Coal Survey, the Government Research Department, and other research groups is not being overlooked, but their equipment cannot be regarded as a satisfactory substitute for full-sized ovens with associated plant. This has long been recognized on the Continent and in America. The coke oven works is the best place to conduct coke oven research and enterprising companies recognize this. There are many problems awaiting solution. Nature itself has precluded quiescence for the coal utilizing industries by the way it has arranged the coal deposits as regards character and quality. The variation and general deterioration in character and chemical purity has rendered indifference to technical control impossible. To manufacture the varieties of coke now demanded and to maintain constant quality, or to improve it to meet changing requirements is a problem the magnitude of which requires no emphasis, and is definitely technical. Coal preparation with regard to cleaning and blending has yet its difficulties. Dry cleaning systems have their limitations when dealing with small or damp coal. The efficient screening of damp coal is an operation of some difficulty. The development of de-dusting systems has brought some advantages, but has not eliminated the difficulty completely. The coking coals of the Durham coalfield for example, are often soft and friable and during mechanical handling abrade to dust very easily, rendering complete dust removal impossible. This same characteristic of friability constitutes the chief obstacle in the application of wet coal cleaning methods. Slurry and moisture both being expensive substances to deal with. If users are going to demand a coke with an ash content approximately proportional to the inherent ash in the coal from which it is made, the technical efficiency of present coal cleaning methods will need to be further improved.

Necessity for Coke Research.

Bearing in mind the effect on plant throughput and the physical and chemical characteristics of the resultant coke, also the varying and drastic market requirements—to say nothing of the markets which our industry is endeavouring to develop—it is clear that continuous research is a necessity, and that every promising avenue should be explored. The point where technical efficiency and economic efficiency become inconsistent with each other varies from one works to another, the market demands being the determining factor.

Low ash content is an advantage for every purpose for which coke is used as a fuel. Apart from its high carbon content resulting in maximum calorific value per unit weight its combustibility is definitely assisted in most of its uses, particularly in the domestic grate. Nevertheless for some purposes the economies effected to the consumer as the result of drastic cleaning may be negatived by the extra cost burdened on the producer.

The nature of the ash is of some importance. If the inherent ash is unduly fusible it may be a necessity to allow a percentage of the free ash to remain to raise the fusion temperature. A blend of clean coal, the inherent ash of which has a high melting point, may produce the desired result, but such coal is not always available.

That sulphur, and for some purposes phosphorous, should be kept low is generally recognized. To control these impurities is more difficult than to control the ash content. The removal of pyritic sulphur, unless finely disseminated through the coal, can be managed within reasonable limits. Practical methods for the reduction of organic sulphur and phosphorous are still wanting.

With regard to the physical characteristics of coke, especially size and hardness, where the maximum is required for metallurgical purposes, experience has shown that this is best obtained by coking at moderate flue temperatures 1,000°-1,200° C. Most of the coking coals in this country will not yield the best coke as measured in these terms by fast coking. This does not detract from the modern oven, but is a characteristic of the coal. Given suitable coal the flexibility of the modern silica oven enables any class of coke to be made. Municipal authorities should encourage the use of small coke for domestic purposes. Reasonably free from ash and properly graded, coke nuts, even from metallurgical coke, are quite a satisfactory fuel and could be used in far greater quantities than at present with advantage to the public and the industry. There are several makes of firegrate available on which coke nuts burn well. The reactivity demanded for coke nuts can be well met by supplying a suitable size, closely graded and reasonably dry. The wider use of coke nuts would help the abatement of smoke, which is becoming increasingly necessary for national health and economy and to assist aviation.

Hydrogenation.

As a result of the advances in the technique of direct hydrogenation of coal, it may in the near future become worth while to separate certain fractions of a coking seam, which at present cannot be discarded, but which adversely affects the quality of the coke from particular plants.

The treatment of gas for new chemical products should be fully investigated. The carbon monoxide, heavy hydrocarbons, and methane have possibilities as basic substances from which other products—*e.g.*, liquid fuels and plastics can be produced, while as a source of hydrogen, coke oven gas is still the cheapest. The establishment of an economically efficient method of methyl alcohol manufacture from coke by the application of the water gas reaction and cheap catalysts is deserving of attention.

With regard to tar, perhaps the most promising variant in present uses will be found in hydrogenation when the technique of the process is sufficiently advanced to enable small units to be profitably attached to coke oven plants of medium size, say, 3,000 to 5,000 tons throughput of coal per week.

The advantages of an extension of the use of coke oven gas as a fuel and propellant is of prime importance. There are still large volumes of high-grade gas available. The claims put forward for the extended use of coke oven gas have been fully established in fact. The practice is becoming general and its wisdom is acknowledged by users and authorities in our sister industry. Eminent authorities have recently stated that as a heating agent gas is more economical in use than electricity and that the future of gas lies in a wide expansion of its uses as a heating agent both for industrial and domestic purposes, and that as far as flexible heat is concerned, gas is the very last word in science. Our Association played its part in urging this matter at the proper time and place, and results have substantiated its claims.

The production and recovery of benzole and its homologues is now a very valuable part of coking practice and is carried out very efficiently on most plants but the last word has by no means been said. The yield and quality is bound up with the design and operation of carbonizing and recovery plant, the physical and chemical nature of the coal charge; also the type of absorbent and chemical system of rectification. Conclusions drawn from research or experience on other than full scale plant should be received with caution and may be very misleading.

The development and adoption of the use of inhibitors in this connection has proved advantageous on many works and has reduced the former losses of motor benzole substantially, but if the rigidity of the specification increases much further and also the complicated treatment of crudes, which is evidently necessary with some benzoles, to meet it, the overall economies and advantages may become questionable.

The chemical composition and molecular structure of coal is not yet fully understood. With the varied heat treatment now possible, due to the availability of type and excellence of refractory materials in this country, it is difficult to conceive a more complex industry or one of greater possibilities. When to this is added the fact that coal is our chief national raw material, a plea for extended research is fully warranted. I feel sure that members generally will support this contention.

Internal Affairs.

Reverting to internal affairs, consequent on the broadening of its constitution, this Association can now claim to be as thoroughly representative of the coking and allied industries as is possible, but this condition increases its responsibilities. The Council fully recognize the fact and would welcome the fullest interest of all classes of members at the respective Section meetings. It is only by doing so that the Association can maintain its position among the important societies of the country and discharge its duties to the industrial interests it represents. When comparisons of the work of this Association with

that of related bodies is made, critics, external and internal, should not overlook the relative resources and support which account for the limitations in the effects of the Association's activities. It is hoped that members will not let this become an excuse for apathy. The year books bear witness to the Association's efforts and those companies and managers who permit and even assist in making the information generally available are thanked for doing so.

The frequent contribution of members to the industry in the way of engineering and plant details on their respective works are deserving of more acknowledgment than is usual, and are often the result of long and patient research, but being local and detailed in character are not given the publicity that large scale work generally gets. Nevertheless in the sum total they constitute important advances. The dissemination of the results of such work constitutes a valuable part of the real business of this Association.

I hope that the general activities of the Association will intensify and that maturity which should come with age will reflect itself in new and greater achievements.

Annual Dinner of the Coke Oven Managers' Association

The Annual Dinner was held at the Hotel Victoria, London, on Thursday, Oct. 24, the PRESIDENT (Mr. T. Westthorp) being in the Chair.

Sir CECIL A. COCHRANE proposing "The Coke Oven Managers' Association," said it seemed to him that the great problem to-day in regard to coke oven plants was the disposal of the coke. In the old days the blast furnace foundries used to absorb practically the whole output. To-day, owing to the multiplication of plants and their greater capacity, there was a big surplus of coke, and that surplus would be steadily increased as the plants which were already nearing completion, and those which were projected, came into operation. The situation called for organized planning, and what were the chief needs? Undoubtedly the first one was research, but all research, to be successful, called for two things—namely, patience and money. Too often when research stations were started, people looked for results to flow therefrom, as they looked for water when they turned on a tap, quite regardless of the intricacy of the problems and the amounts of lumber that had to be cleared away and the difficulties which had to be overcome before it was possible to get at the kernel. There were four Research Committees dealing with coke in this country at the present time, and they were doing splendid work. In some way important results had already been achieved, but he felt quite confident in saying that these results would have been forthcoming sooner, and more important work would have been done, if more funds had been available, and therefore he said to all those engaged in the coke industry that if they really believed in research, and that if their expressed admiration for it was more than lip service, they must find the funds to carry out research work adequately. [Hear, hear.] After all, highly trained research workers were worthy of their hire, and apparatus and laboratory equipment cost money. It was unreasonable to expect laboratories which were starved of the necessary equipment and which were insufficiently staffed to make any important progress in the desired direction.

The President in his Address had given an admirable survey of the Industry, and referred to the advisability of large-scale experiments, and with that view he himself was in complete agreement. Those who had worked in the laboratory knew how often a laboratory experiment which promised great things dashed all hopes when it was applied on the large scale. He had heard it whispered that the Fuel Research Board had toyed with the idea of erecting experimental ovens at the Fuel Research Station. Without knowing whether that was the case or not, he could not help thinking—and he put it forward with great diffidence in the presence of such a company—that it would be far better for these experiments to be carried out on existing coke oven plants in the various districts. [Hear, hear.] Was it, he wondered, too much to ask that the owners of the great coke oven plants in the various coking districts should put at the disposal of the Fuel Research Board or the Coke Research Committees two or three ovens for a period on which full scale experiments could be carried out? The expense would be nothing like so great as erecting ovens at the Fuel Research Station, and it seemed to him that there would be the great advantage of the benefit of local knowledge and facilities for testing various seams of coking coal in the immediate district on the various types of ovens existing in that district. It would not involve a great deal of expense, nothing like the expense it would be if the Fuel Research Board undertook the erection of coke ovens, because the owners of the ovens in the districts would have all the by-products and the coke, and any additional expense with regard to labour, supervision, and so on might be re-imbursed to the owners of the ovens out of a common pool. The researches would be carried out by a travelling staff of researchers. He was quite aware that it would be purely a coke research and not a by-products research. This latter could not be done, but it might be a very thorough coke research, and difficulties which might occur to some people, such as the segregation of the coal in the bunkers, for instance, could be avoided by making use of an auxiliary pocket bunker such as was now fitted, he believed, in all modern bunkers, and might be fitted to any existing ones.

Selling Organization.

Another point he was going to venture to call attention to, and which he regarded as one of the weaknesses to-day, was the selling organization in the Industry. [Hear, hear.] He had already suggested that the major problem was the disposal of the coke. The output of blast furnaces was a limited one, and the output of the ovens had already far outstripped it, but there was at hand the domestic market, which had not been cultivated as it ought to have been cultivated and as it might still be cultivated. It was a rather lamentable fact that there had been up to the present time little or no co-operation among coke producers, with the result that they were obtaining lower prices for their products than they might have been if they were not cutting each other's throats. He quite recognized the difficulty in co-ordinating qualities and prices of various cokes. The coal trade was up against this every day; nevertheless he felt that if there was the will a way would be found. They must set up an organization for selling, and to do that it was necessary to enter upon intensive propaganda, but that propaganda would not be of very much use unless strenuous efforts were made to meet the requirements of the consumers. The days were long past when "anything" would do. The purveyors of oil, gas, and electricity had goods which did not vary in quality from day to day, and coke must not vary in quality or in mechanical condition or in its grading if it was hoped to satisfy and keep the consumers. There must be uniformity.

Lastly, he wanted to suggest that the coke industry should cultivate the closest possible relations with the Gas Industry in this country. [Hear, hear.] The gas companies were willing consumers of coke oven gas if they obtained it at a reasonable price. What he wanted to plead for, therefore, was that the coke industry should look upon the gas companies not as competitors but as friends, because he was sure the gas companies were the best friends of the coke ovens. It must not be overlooked that for every million cu.ft. of gas which the coke ovens sold to gas companies they were taking, roughly speaking, 35 tons of coke off the market, and the bulk of that coke could be supplied and replaced by the products of the high-temperature ovens owing to the fact that the flexibility of the modern ovens permitted of a wide range of production so far as quality was concerned. Everybody knew what the Sheffield Gas Company had done in the way of taking coke oven gas, and the Newcastle Gas Company was now taking no less than 50% of its requirements in the form of coke oven gas, and this was supplied by the Company which the President of the Association and himself had the honour to be associated with—namely, the Consett Iron Company, which incidentally, supplied the largest quantity of gas to a gas company of any single coke oven company in the country—some 10 million cu.ft. per day in the winter. It might be that he was over-sanguine, but he looked forward to the day when in every industrial district there would be a gas grid from which manufacturers would be able to draw their requirements for heating and lighting and power in the most convenient form it was possible to have them. Thus it was he contended that if the Industry concentrated firstly upon research and secondly upon improving the selling organization and getting closer together by way of co-operation, and, finally, by cultivating closer relations with the gas companies—and these relations need not stop at selling gas to the gas companies, but might easily be extended to making reciprocal arrangements with regard to selling coke—there was a bright future before them.

A Good Case.

The PRESIDENT, responding to the Toast, said that research was a matter upon which he had already expressed his own views, and it was a source of great satisfaction to know that he had a good deal of sympathy from Sir Cecil Cochrane, who had made out such a good case for extended research. He felt that if they could find some satisfactory economic method of converting all coke into liquid and gaseous fuels they would

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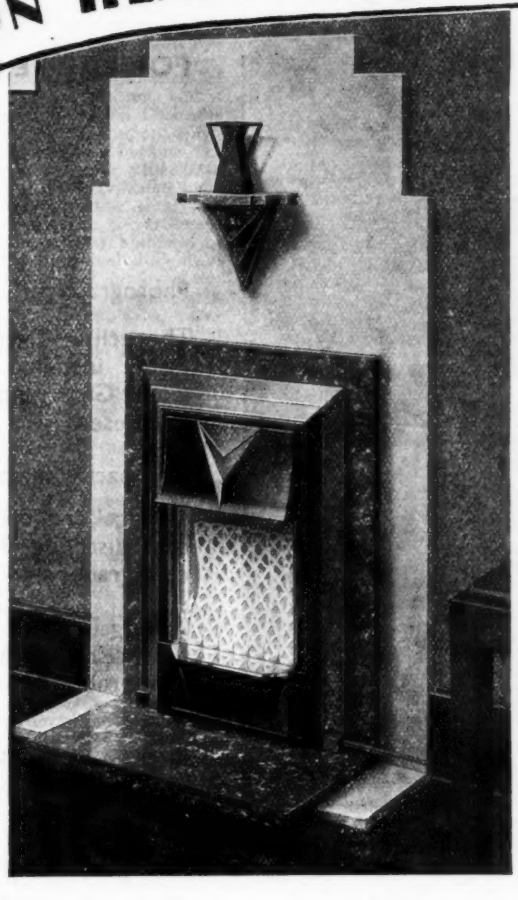

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be able to ignore metallurgical coke as a means of providing existence for the plant. That, however, was by the way, but it was something he would like to see carried out in the future. Sir Cecil had made some reference to gas, but he felt it could be honestly claimed that the Association had done something for the Industry in that direction and that it could be left to ordinary business negotiations to bring about the results which Sir Cecil Cochrane had described as being so desirable.

It was not the business of the Association to deal with sales matters, but there was one aspect in this connection which concerned the Association—namely, that coke oven managers and their staffs did not like to waste time searching for causes, the effects of which only existed in the minds of the users of coke. Research was undoubtedly an important matter, and it was to be hoped that the suggestion which Sir Cecil Cochrane had been good enough to make would be acted upon. The people to be looked to were the coke oven owners because the Government was already providing something like £100,000 a year for this class of research. Actually, however, coke oven research occupied a very limited amount of the time and energy devoted to this class of research by the Government, and personally he held the view that unified research should be carried out by the Industry itself. Many technical difficulties had been overcome and research was being carried out by enterprising firms who regarded it as a necessary part of their business, but they could not, nor could they be expected to, carry the burden for the whole Industry. There was little doubt that there were no major experiments which could be carried out which would not have direct significance for every concern in the Industry. It was true that coals varied, but they did not vary all that amount, and any major experiment would have some significance for every coking plant in the country. The details of such unified experiments could be gone into at the Sectional Meetings of the Association.

Mr. G. W. J. BRADLEY, who proposed " Our Guests," said the Association was fortunate in having a larger number of guests than usual and was happy to include among them many who had been friends of the Association from its early days.

Sir WILLIAM J. LARKE, whose name, together with that of Colonel Carr, was associated with the toast, said that while the problems of production were soluble, the problems of distribution had not yet been studied by but very few industries, and certainly only to a limited extent by the industries which were called basic. Therefore, if they wanted a journeyman's wage they must sell their product not on the basis of a cut-throat competition and believing that the lowest price was in itself a worthy method of securing business. Business could only be secured on the basis of giving the maximum value per unit of price, and that could only be done by studying the needs of the consumers. His own industry, continued Sir William, was one of the consumers for the coke oven industry, although he would like the coke oven industry to look upon the iron and steel industry as a kind of flywheel consumption and not necessarily the main outlet for the products of the coking industry, particularly in these days of applied science in the use of materials. As a humble member of the Fuel Research Board who had come back to it after having previously served four years on the Board, he was quite sure, although anything he said could not be taken as being official, that the Fuel Research Board would be only too delighted to know that the coking industry was following up the stimulating Presidential Address of Mr. Westthorp and was establishing a collective research scheme under its own auspices and its own management, even if it only went to the length of providing machinery and channels whereby the experience of each member of the industry was made available to all others. After a long experience of applied research in engineering, in electrical engineering, and in the iron and steel industry, and also as Chairman of the Accounts Committee of the Department of Scientific and Industrial Research, in which he had become acquainted with everyone of the collective industrial research associations, he could say that no one member of an industry could contribute as much to the common pool as was possible if an organized effort was made; nor would they get as much out of it, and he could assure them that so far as the general attitude to research was concerned, those who were consumers were very gratified with the results they had obtained in close co-operation with the coking industry through the four Coke Research Committees—but what was that work for a great industry like this with, possibly, a productive capacity of 14 million tons and an active production to-day of 11 million tons? What were they spending, including contributions which the iron and steel industry made and including also the grant received from the Government? The expenditure on research was less than one-tenth of a penny per ton on present production, and that was not worthy of a great industry that was endeavouring to find new outlets for its products. Another necessity—and this applied to all industries—was statistical control of production and productive plants. Were he engaged in this industry he would not be content with a position in which the productive capacity was beyond the consumptive power of the markets. He would rather say that the problems of production had been solved, but that the same energy, enthusiasm, efficiency, and scientific application should be given to the problems of distribution, and if that were done they would soon be able to cope with their productive capacity.

Closer Co-operation.

Col. W. M. CARR, who also responded, said he was delighted, as President of The Institution of Gas Engineers, to hear what Sir Cecil Cochrane had said as to the desirability of very much closer co-operation between the Gas Industry and the coke oven industry. They were both working for a common objective, and the time had passed when they should continue to work in opposition to, or at any rate independently of, each other. The function and object of both industries was to supply cheap and convenient fuel for the needs of the nation—*i.e.*, the best utilization of coal. They were both in the carbonization industry and believed that the best utilization of their coal resources was by the method adopted in the industries which they served, which was really one and the same. There was, however, as Sir Cecil Cochrane had pointed out, a great deal to be done on both sides in getting on to a common basis. The Gas Industry must apply itself to chemical research to achieve a better utilization of coal. As a matter of fact, more progress had been made in carbonization of coal and the manufacture of gas in the last twenty years than in the utilization of gas, but the Industry was endeavouring to make up the lost ground. There were possibilities for common research, not only in the matter of the quality of coke, but also in the utilization of gas. The coking industry had looked upon gas as a by-product, but it had been very clearly indicated during the evening that gas was becoming no longer a by-product but one of the main products of the coke oven industry. Therefore, the two industries which were practically one and the same must get closer together for the better marketing and selling of their products to the public.

In that connection, said Colonel Carr, he would like to say something about the quality of coke and to express the hope that his friends who were directly interested in the coal industry and who were present at the dinner would bear in mind that it was just as essential that a gas undertaking situated at some distance from the coalfield, and would never be able to have the advantage of a supply of coke oven gas, should have coal which would produce a coke which could be readily sold and utilized. There was a feeling that coal of an inferior quality to that used in coke ovens could be utilized in gas-works, but that was not so. Coal containing a large percentage of ash should not be used for making coke either in coke ovens or at gas-works. Unfortunately, such coal had had to be used to a great extent in the past, with the result that coke as a whole had suffered. The public had said the coke could not be used because it created so much clinker, and therefore again he submitted that on this question of quality of coke and research the two industries were on absolutely common ground, and must work together and support one another. Another factor to be borne in mind was that both industries had a great competitor in oil. He as a seller of gas probably appreciated that fact very much more than many who had been selling solid fuel. It was not generally appreciated by them to what extent oil was being used to-day in industry when it should be used as coal in the form of gas. There was no reason whatsoever in our industrial areas why imported oil should be used at all. The Gas Industry had been given greater freedom in the last year or two and was now making use of that freedom to introduce tariffs which would make it a more economic proposition to use gas than to use imported oil, and this was a direction in which the Gas Industry looked for the co-operation and assistance of the coke oven industry. Therefore, he hoped that what had been said that evening would have the result of bringing the two industries into much closer co-operation than hitherto.

Joint Control of Gas and Electricity at Halifax

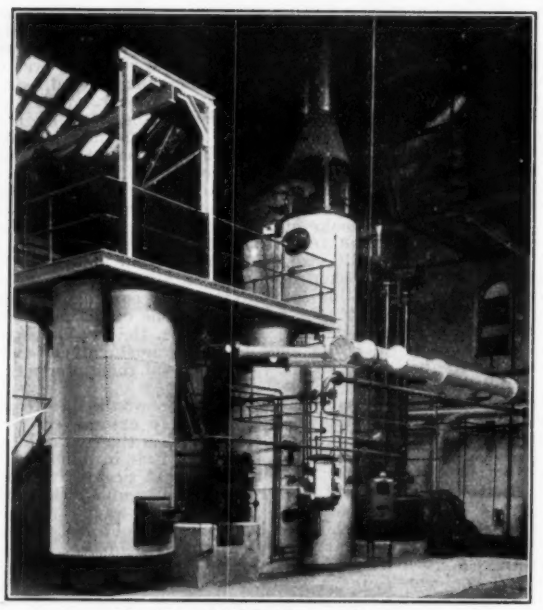
At a meeting of the Halifax Town Council on Oct. 23 it was decided after a lengthy debate to merge the Gas and Electricity Committees into one Committee to be called the Light, Heat, and Power Committee. At the same meeting it was also agreed that the Watch Committee should be given control of expenditure for public lighting, which has hitherto been held by the Gas Committee.

In the course of the debate Alderman Gledhill moved an amendment to the effect that before a decision was taken a full report should be prepared by each Committee (Gas and Electricity). He pointed to the large number of towns which had expressed an opinion against joint control and mentioned that Bolton, Burton, Belfast, Dewsbury, Leicester, Manchester, Newcastle-under-Lyne, Rochdale, Spenborough, Stockton, and Wallasey had had experience of joint control but had discontinued the policy.

Councillor Midgley (Vice-Chairman of the Electricity Committee) registered a protest against the proposal. Abolishment of competition did not necessarily spell economy. A reduction in administration costs was not going to produce efficiency, which was the first essential of success.

In support of the proposal Alderman Watkinson observed that, whether they liked it or not, gas was " going out." To this Councillor Regan (Vice-Chairman of the Gas Committee) retorted that, whether the Council liked it or not, the Gas Committee had been making progress. The Council need not be under the impression that they were going to carry the Gas Committee on their back by this merger. He felt, however, that joint control would prevent waste of money, and assist both departments to greater progress.

New Carburetted Water Gas Plant Inaugurated at Paisley



The New C.W.G. Plant at Paisley.

The new Humphreys & Glasgow carburetted water gas plant, inaugurated to-day at Paisley, is the largest unit of a new design yet erected, and incorporates many new and interesting features.

The new automatically-operated carburetted water gas plant at Paisley has a guaranteed daily capacity of 750,000 cu.ft. of 500 B.Th.U. gas. It comprises a water gas generator; a carburettor and a superheater in which the enriching oil gas is produced; a washer which effects the primary cooling of the gas and provides a safety hydraulic seal between the generating plant and the relief gasholder; a multitubular water-cooled condenser, and a tar separator. Steam turbine blowing plant in duplicate is provided.

As is standard with all Humphreys & Glasgow modern construction, the generating plant incorporates their back-run process. All the working valves of the plant are positively controlled by the automatic operator, which, together with all gauges, instruments, controls, and safety devices, is conveniently arranged at ground floor level—a particularly important feature with automatically-operated plant which requires only occasional attention. The attendant has to ascend to the upper floor only at infrequent intervals for charging coke into the generator. All controls, gauges, valves, &c., are grouped so as to be simultaneously in view at ground level. The whole of the plant is readily accessible for inspection and overhaul.

The automatic operator is driven through suitable reduction gearing by an electric motor, and is connected by direct drives to the various working valves. The machine is readily adjusted to any variations of gas-making cycle which may be required by changes in the coke or oil used, and a safety system of valve interlocking positively prevents the movement of valves other than in safe sequence. The attendant is immediately warned of any irregularity in operation by the sounding of a Klaxon horn and by suitable light signals. An electric bell rings when the generator is due for charging.

One particularly interesting feature of this system of operation is the automatic proportioning of the secondary air supply to the carburettor to suit the varying combustible in the blast gases issuing from the generator. An electric pyrometer is provided to facilitate the maintenance of the correct working temperature in the fixing chambers.

Levers are provided for convenient handworking of the plant, should the electric current to the automatic operator fail; the system of valve interlocking also safeguards hand working.

Coke is wheeled to the plant in a special rapid-charging skip which is raised by a travelling electric hoist to the charging platform, and moved into position over the generator. The whole operation of charging requires only a few moments.

Suitable provision is made for the future duplication of the plant, the blast main and gas connections being provided with the necessary branches.

The whole of the installation is of British manufacture and design, and the steel construction has been carried out in local shops.

London and Southern District Juniors

Visit to Die Casting Works

An unusually interesting visit was paid by members of the London and Southern District Junior Gas Association on Oct. 26, when they inspected the works of the Non-Ferrous Die Casting Company, Ltd., at Cricklewood, N.W. 2.

The members were welcomed by Mr. D. Robertson (Managing Director of the Company) before proceeding to inspect the factory. It is worthy of note that, in view of the visit, the foreman of the works and a number of operatives volunteered to remain at work, although it was a Saturday afternoon, and as a result of this very unselfish action the visitors were enabled to witness the various die casting operations in a way which would not otherwise have been possible. It may be mentioned that this spirit is typical of the good feeling which pervades this works at all times.

The term die casting is usually applied to castings which are produced in steel dies, and the metal is introduced into the dies by pressure. The pressure varies under the different systems of manufacture from a comparatively low pressure to a high pressure, reaching in some cases to over 2,000 lb. per sq. in.

Another form of manufacture which is known as die casting is really better described as permanent mould casting. This is where the dies are constructed in steel, or other suitable alloys, and one depends upon a gravity feed to obtain the castings. There are also castings made by vacuum. These are very similar to those produced by pressure. Then, of course, there is centrifugal casting, where one depends upon the metal being forced into the steel die by means of centrifugal force.

Pressure castings were originally produced in type metal, tin base alloy, and zinc base alloy, but now they are produced in one or two aluminium alloys and what is termed high tensile zinc base alloy, the latter having a high tensile strength of between 15 and 20 tons. It is also now, under one or two processes, possible to pressure cast in the more difficult aluminium alloys, such as Al-silicon alloy and aluminium-copper alloy, known in the trade as L.33 and L.8. Advances have also been made recently

with the die casting of brass by the pressure process. This, however, is very difficult, due to the high temperature of the metal and the difficulty of obtaining steel which will stand not only the pressure which is considerable but the erosion of the metal coming in under pressure. Brass die casting by the gravity process is, however, a commercial proposition.

It is possible with pressure die casting to get a superior finish in zinc and aluminium alloys, but it is practically impossible to guarantee any casting produced by pressure to be entirely free from porosity, although in the majority of cases a small inclusion of air or gas is not detrimental to the job.

When castings are produced with a very high pressure the metal to a certain extent is pulverized and this enables the castings to appear much more solid. Where, however, it is necessary that the casting should be perfectly homogeneous, solid gravity castings are best, because one is able to get rid of the air and put risers on the job, and so enable the metal to draw from the risers and thus obviate air inclusions and cavities caused by the metal shrinking on itself. So far as pressure die castings are concerned, it is necessary that large quantities of castings should be made at a time to make it economic. One can therefore assume 5,000 is the minimum number to be considered under the heading of pressure die casting, and although the tool charge for pressure die casting is very much higher than for gravity die casting, when one comes to spread it over, say, 50,000, then it amounts to a figure hardly worth considering, apart from the fact that when producing a large batch such as 50,000 castings the cost is very much lower than by gravity.

It is not possible yet to produce all jobs by pressure die casting. Numbers of them still have to be produced by the gravity process. So far as the gravity process is concerned, the tool charge is much lower and smaller numbers can be turned out economically.

It is possible, so far as aluminium and zinc base castings are concerned, both by gravity and pressure, to cast in inserts where it is necessary for the casting to stand a considerable amount of wear. So far as limits are concerned, pressure castings can be worked to finer limits than gravity, but it is wise to consider, when designing, a tolerance of 0·005 to the inch.

The firm are always prepared to consider any rough sketches of articles required and to give advice as to the method of manufacture, limits, and alteration of design to simplify the castings and reduce the price.

The Non-Ferrous Die Casting Company, Ltd., are strong supporters of coal gas, using as they do almost 25 million cu.ft. per annum. After some years' operation of a producer gas plant it was found that coal gas furnaces, under the Gas Light and Coke Company's industrial rates, were not only cheaper but more reliable. Furthermore, after suffering on more than one occasion by reason of electricity failures, the firm are now utilizing gas for all the main shop lighting as well as for power purposes by means of a small gas engine.

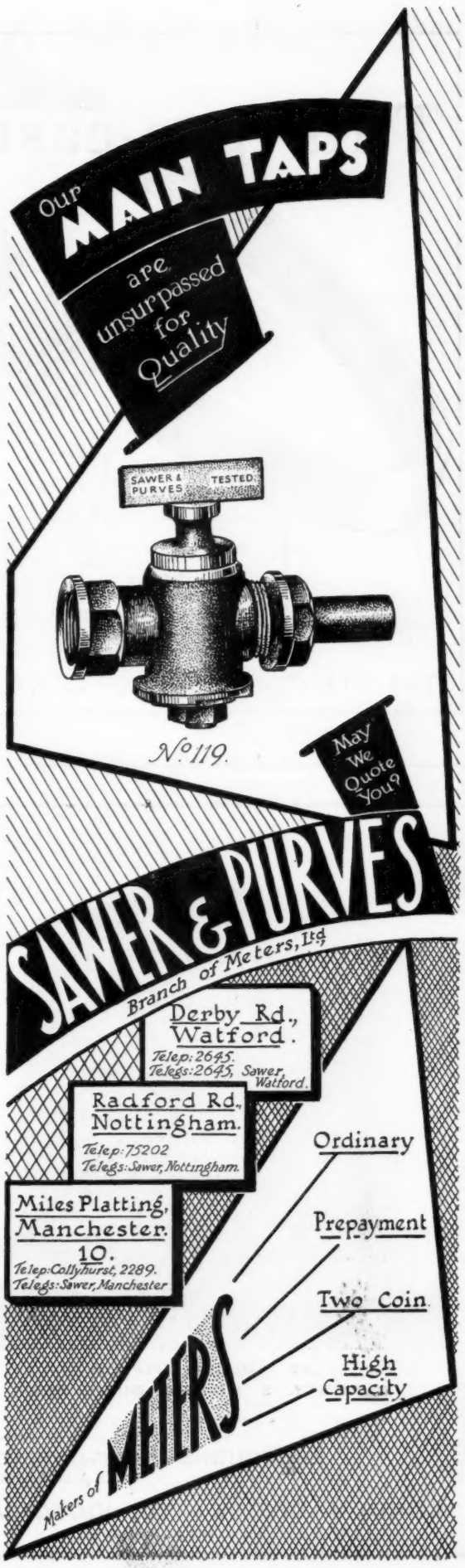
At the conclusion of the inspection of the works, Mr. Robertson gave the visitors a comprehensive account of his firm's activities, with details of the various processes and the different non-ferrous metals used. He also answered a number of questions which were raised by members.

Subsequently tea was kindly provided by the Company, and the PRESIDENT of the Association (Mr. J. M. Webber, of the Croydon Gas Company) proposed a very hearty vote of thanks to the Company, to their Managing Director (Mr. Robertson), and to his son and the other guides who had shown them round. A visit of this kind, said Mr. Webber, was something entirely new for members of their Association, and it was very good for them to get in touch with new things. Half the battle was to be in the position of knowing where to obtain something one wanted. Not only had they been shown round the works, observed the President in conclusion, but a very complete account had been given them of the processes involved in die casting.

Home Truths about Cooking.

"Gas engineers still have a strong hold on large kitchens," admitted Mr. Oscar C. Waygood, M.I.E.E., Chief Engineer to Lewis's, Ltd., Liverpool, in an address which he gave on "The Engineering Problem in a Modern Store" to members of the Mersey Centre of the Institution of Electrical Engineers.

He said that Gas Engineers would maintain that hold until such time as the electrical engineer could guarantee satisfaction to the user on design, maintenance, and operating costs, particularly the latter. The problem of the kitchen is one that should be very seriously considered jointly by the supply authorities and the manufacturers, so that the public might have definite and authentic information at their disposal in order that a particular problem might be dealt with without fear or prejudice.



This pre-cast Lead Ring

cuts out run lead and caulking

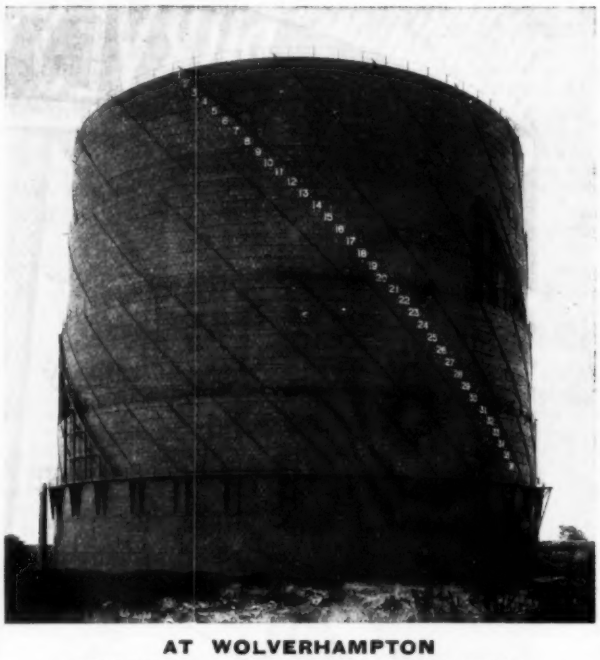
Using a spanner as his only tool, an unskilled workman can make the Stanton Mechanical Lead Joint in a fraction of the time which it takes a skilled hand to run lead into and caulk an open socket joint. A pre-cast lead ring is slipped over the spigot, two half-collars are placed in position, and the jointing operation is completed by the tightening of four cast-iron set-screws.

Inside the lead ring is cast a corrugated steel spring insertion ring, which uniformly distributes the end pressure so that the joint is effective throughout its full depth—and not for a portion only as in a caulked joint. The ring is mechanically held in position and cannot be dislodged by "drawing" of the spigot.

PATENT No. 404955
OTHER PATENTS PENDING

STANTON MECHANICAL LEAD JOINT

THE STANTON IRONWORKS COMPANY LIMITED, Nr. NOTTINGHAM



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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

A somewhat more hopeful outlook on the international situation was enough to bring about a much-needed stimulus to markets last week, and in nearly all sections business was on a heavier scale than for some time past. Prices substantially advanced, and a feature was the revival in gilt-edged securities, which more than recovered the losses sustained during the previous six weeks. Similar conditions prevailed in the Industrial section, where the demand was still further fostered by the latest encouraging company reports, while in the more speculative class rubber and tin shares became increasingly active.

It will be remembered that except in a few isolated cases Gas stocks and shares have not suffered to the same extent as securities in other sections during the recent critical period, so that the sudden upward movement in prices which has been a feature elsewhere could not be expected in the Gas Market. It is satisfactory to note, however, that several stocks which had been somewhat depressed even before the crisis have now begun to recover. A renewed demand set in for South Metropolitan ordinary stock and the price was raised 5 points to 127½, business being recorded at 130 against last week's highest of 123½. Gas Light units also further advanced, the price moving up 6d. to 27s., while Wandsworth ordinary gained 2 to 159½. The only serious set-back occurred in Imperial Continental ordinary, which dropped 14½ points to 200 on the interim dividend announcement, the distribution being 4% against 5% a year ago.

Current Sales of Gas Products

The London Market for Tar Products.

Oct. 28.

Prices of tar products remain steady at about the following levels:

Pitch, 32s. 6d. per ton f.o.b.

Creosote is firm at 5¾d. per gallon.

Refined tar, 4d. per gallon in bulk at makers' works.

There is a very heavy call for toluole, the pure grade realizing 2s. 5d. to 2s. 6d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, about 1s. 6d.; and 90/160 pyridine, 4s. 6d. to 4s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

Oct. 28.

The average prices of gas-works products during the week were: Gas-works tar, 18s. to 23s. Pitch—East Coast, 33s. to 35s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 33s. to 35s.* Toluole naked, North, 2s. to 2s. 2d. Coal-tar crude naphtha, in bulk, North, 7¼d. to 7½d. Solvent naphtha, naked, North, 1s. 5½d. to 1s. 6d. Heavy naphtha, North, 11½d. to 1s. Creosote, *ex* works, in bulk, North, liquid and salty, 4½d. to 4⅝d.; low gravity, 4⅝d. to 4¾d.; Scotland, 4⅝d. to 4¾d. Heavy oils, in bulk, North, 4¾d. to 5d. Carbolic acid, 60's, 2s. 1d. to 2s. 2d. Naphthalene, £13 to £15. Salts, 70s. to 75s. bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Oct.* 26.

All products, excepting tar and pitch, are now commanding considerable attention, with prices tending upwards.

Crude gas-works tar.—The actual value is 26s. to 28s. per ton *ex* works in bulk.

Pitch remains dull at 30s. per ton f.o.b. Glasgow for export, and 30s. per ton *ex* works in bulk for home trade.

Refined tar is available in large quantities at round 2¾d. per gallon, f.o.r. in buyers' packages.

Creosote oil.—Supplies are not too plentiful, but prices remain unchanged. B.E.S.A. Specification, 5¼d. to 5⅜d. per gallon; low gravity, 5¼d. to 5½d. per gallon; and neutral oil, 5¼d. to 5½d. per gallon; all f.o.r. in bulk.

Cresylic acid.—Demand for this during the week has been about normal and prices in this district are firmer as follows:—Pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 1½d. to 1s. 2d. per gallon; and pale, 99/100%, 1s. 4d. to 1s. 5d. per gallon; all *ex* works naked.

Crude naphtha.—Available supplies command 4½d. to 5d. per gallon f.o.r., according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3½d. to 1s. 4d. per gallon, and 90/190 heavy naphtha is nominal at 11½d. to 1s. per gallon.

Motor benzole is purely nominal at 1s. 3½d. to 1s. 4d. per gallon in bulk at makers' works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole . . .	0 9½	to	0 10	per gallon at works
Motor ,, . . .	1 3	,,	1 3½	,, ,, ,,
90% ,, . . .	1 4	,,	1 4½	,, ,, ,,
Pure ,, . . .	1 7½	,,	1 8	,, ,, ,,

Contracts Advertised To-Day

Coke Screening Plant.

Bury Gas Department. [p. 326.]

Compressor.

Stockport Gas Department. [p. 326.]

Exhauster.

Stockport Gas Department. [p. 326.]

Gasholder.

Leigh (Lancs.) Gas Department. [p. 326.]

Gasholder Resheeting.

Ennerdale Rural District Council. [p. 326.]

Trade Notes

"Cheaper Power."

We have received from Messrs. J. Browett Lindley (1931), Ltd., a copy of their new publication "Cheaper Power" dealing with back pressure and extraction steam engines. The publication contains original curves and data produced by their engineering department which enable any economy to be obtained in any particular case to be easily calculated.

Steam-Driven Compressors for Stretford.

The Stretford and District Gas Board have placed an order with Messrs. George Waller & Son, Ltd., Phœnix Iron Works, Stroud, for two sets of vertical "Duplex" enclosed type steam-driven gas compressors, each set to deal with 200,000 cu.ft. per hour against a discharge pressure of 30 lbs. per sq.in. These machines are for dealing with their rapidly increasing industrial load.

"Colosyl" Degreasants.

A series of degreasants are now being manufactured by Industrial Colloids, Ltd., Altrincham Bridge, Manchester, under the trade name of "Colosyl." These are claimed by the makers to fulfil a long-felt need in the way of a satisfactory solvent for grease which can be prepared at the extremely low cost of twopence per gallon. "Colosyl" brand degreasants are supplied in crystalline form, easily stored, and ready for simple preparation in solution with hot water.

Gas Undertakings' Results

Oswaldtwistle.

The annual accounts of Oswaldtwistle District Council show a gross profit on the Gas-Works of £3,871, against which is charged sinking fund instalments £2,147, interest on loans £1,213, and income-tax £564, leaving a net profit of £330, against £1,348 last year. This amount has been transferred to the revenue appropriation account. The total rental for gas consumed was £15,810, including £701 for public lighting, which, after deducting £523 for discounts, left a net income from gas rental of £15,287, against £16,293 for the previous year. The consumption of gas shows a decrease of 1,185,100 cu.ft. The capital outlay during the year was £428, making the total outlay on the Gas Department to March 31 of £123,989. The outstanding mortgage debt is £31,600.

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Albion Ironworks, Manchester

is the nucleus of a world-wide Organization fully equipped and staffed for the purpose of bringing expert attention to the problems of Gas Production, and for rendering useful service in many directions to the Gas Engineer individually and the Industry generally.

Research, Design, Manufacture and working-scale Tests are carried on with the advantages of close interdepartmental contact, and the object of Gas Advancement is kept in view in all these operations.

"Repeat Orders" for extensions have recently been received from the Wellingborough Gas Light Company, the Salford Corporation Gas Department, the South Brisbane Gas and Light Company, the Tarbes & Vannes Gas Works, France, and the Montrose Gas Company, Ltd.

THE WEST SYSTEMS
FOR COAL CARBONIZATION AND RELATED PROCESSES

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STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 25.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Sept. 9	7	7	Alliance & Dublin Ord. ...	130—140	...	...
374,000	,,	June 24	4	4	Do. 4 p.c. Deb. ...	97—102	...	...
557,655	,,	Aug. 12	7	7	Barnet Ord. 7 p.c. ...	165—170	...	...
300,000	1	Oct. 7	1/9⅝	1/4⅛	Bombay, Ltd.	1⅜—1⅝*	...	27/4½—27/6
178,480	Stk.	Aug. 12	9½	9½	Bournemouth sliding scale ...	222—232	...	230
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	168—173	...	172—173
489,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152	...	...
50,000	,,	June 24	3	3	Do. 3 p.c. Deb. ...	83—88	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
357,900	,,	Aug. 12	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	172½—174
649,955	,,	,,	6¾	6¾	Do. 5 p.c. Con. ...	156—161	...	...
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref. ...	142—147	...	...
1,487,500	,,	July 8	5	5	Bristol, 5 p.c. max.	120—122*a*	...	...
120,420	,,	June 7	4	4	Do. 1st 4 p.c. Deb. ...	102—104*a*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	101—103*a*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	127—130*a*	...	...
855,000	,,	Sept. 23	8	7	British Ord.	152—157	...	...
100,000	,,	June 7	7	7	Do. 7 p.c. Pref.	155—160	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. "B" Cum. Pref.	112—117	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	99½—100
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114	...	...
200,000	,,	,,	...	17/6⅝	Do. 3½ p.c. Red. Deb. ...	99—101	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	June 24	4½	4½	Do. 4½ p.c. Deb. ...	83—88	...	...
626,860	,,	July 22	6	6	Cardiff Con. Ord.	127—132	...	...
237,860	,,	June 7	5	5	Do. 5 p.c. Red. Deb.	107—112	...	...
157,150	,,	Aug. 12	6½	5	Chester 5 p.c. Ord.	109—114*b*	...	...
98,936	1	Sept. 23	2/-	2/-	Colombo, Ltd., Ord.	1⅝—1¾	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20/—22/	...	...
609,204	1	Oct. 7	-/11'48	-/11'48	Colonial Gas Assn. Ltd. Ord.	19/6—21/6*	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	24/6—26/6*	...	...
1,775,005	Stk	Aug. 12	6	5	Commercial Ord.	100—105	...	102
620,000	,,	June 7	3	3	Do. 3 p.c. Deb. ...	82—87	...	86
286,344	,,	Aug. 12	5	5	Do. 5 p.c. Deb. ...	121—126	...	123½—125
807,560	,,	Aug. 12	7	7	Croydon sliding scale... ...	151—156	...	...
569,590	,,	,,	5	5	Do. max. div.	113—118	...	...
620,385	,,	June 24	5	5	Do. 5 p.c. Deb.	123—128	...	126¾—127
542,270	,,	Aug. 12	10	7	Derby Con.	175—185*c*	...	...
55,000	,,	June 24	4	4	Do. 4 p.c. Deb.	100—105*c*	...	...
239,000	,,	Aug. 12	5	5	East Hull Ord. 5 p.c. ...	109—112	...	...
181,625	,,	Aug. 12	6	6	East Surrey Ord 5 p.c. ...	129—134	...	...
175,609	,,	June 7	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
19,313,481	,,	Aug. 12	5½	5½	Gas Light & Coke 4 p.c. Ord.	26/6—27/6*f*	+·/6	26/7½—27/3
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	88—92	...	91
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	105—108	...	107½
8,602,497	,,	June 7	3	3	Do. 3 p.c. Con. Deb. ...	84—89	−1½	85½—88½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	114—118	...	115½—116¾
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	112—116	...	113—114½
270,466	,,	Aug. 12	6	6	Harrogate New Cons. ...	132—137	...	...
140,000	1	Sept. 23	1/7½	1/7½	Hongkong & China, Ltd. ...	1¼—1½	...	...
213,200	Stk.	Aug. 12	6	6	Hornsey Con. 3½ p.c.... ...	130—135	...	...
5,600,000	,,	May 13	10	14	Imperial Continental Cap. ...	190—210	−14½	209½—214½
223,130	,,	July 22	3½	3½	Do. 3½ p.c. Red. Debs.	91—96	...	95¾
285,242	,,	Aug. 12	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—180	...	...
2,167,410	,,	Aug. 12	6	6	Liverpool 5 p.c. Ord.... ...	133—135*b*	...	...
245,500	,,	June 7	5	5	Do. 5 p.c. Red. Pref. ...	105—110*b*	...	...
306,083	,,	July 8	4	4	Do. 4 p.c. Deb.	105—107*b*	...	...
165,736	,,	Aug. 26	10	8	Maidstone 5 p.c. Cap. ...	182—192	...	...
63,480	,,	June 24	3	3	Do. 3 p.c. Deb. ...	80—85	...	...
75,000	,,	May 27	†10	†10	Malta & Mediterranean ...	210—220	...	...
392,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	98—103	...	...
231,978	Stk.	Aug. 12	5	5	M. S. Utility "C" Cons. ...	108—113	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	100—105	...	104—104½
360,075	,,	June 24	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	120—125	...	...
125,000	—	July 1	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	97—100	...	...
675,000	,,	June 24	†13	†13	Montevideo, Ltd.	48—53	...	...
2,061,315	,,	Aug. 12	5¾	5	Newcastle & Gateshead Con.	24/6—25/6*df*	−·/6	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	107—108*d*	...	...
776,706	,,	June 7	3½	3½	Do. 3½ p.c. Deb. ...	99½—100½*d*	−1	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107*d*	...	...
274,000	,,	Aug. 12	5	5	Newport (Mon.) 5 p.c. max....	113—118*a*	...	...
225,000	,,	Aug. 12	7½	7½	North Middlesex 6 p.c. Con.	162—172	...	175
396,160	,,	Aug. 12	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.	167—172	...	...
416,617	,,	June 7	8	8	Plym'th & Stonehouse 5 p.c.	162—167	...	...
504,416	,,	Aug 12	8½	8½	Portsm'th Con. Stk. 4 p.c. Std.	172—177	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	112½
114,000	,,	July 22	5	5	Preston 5 p.c. Pref.	106—111	...	...
321,961	1	Sept. 23	...	1·-	Severn Val. Gas Cor. Ld. Ord.	22/—23/-	...	22/3—23/-
319,510	1	,,	...	-/10½	,, ,, 4½ p.c. Cum. Pref.	21/9—22/9	...	22/—22/3
1,736,968	Stk.	Aug. 26	6	6	Sheffield Cons.	140—142*e*	+1	...
95,000	,,	June 24	4	4	Do. 4 p.c. Deb.	102—104*e*	...	...
133,201	,,	Aug. 12	5	8½	Shrewsbury 5 p.c. Ord. ...	145—150	...	...
90,000	10	May 27	†3	†3½	South African	3—4	...	...
1,061,779	1	Sept. 23	1/2⅞	1/2⅞	South East'n Gas Cn. Ld. Ord.	27/6—28/6	...	28/—28/4½
845,016	1	,,	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	22/3—23/3	...	22/—22/3
450,000	Stk.	Aug. 12	4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Aug 12	6½	5	South Met. Ord.	125—130	·5	123½—130
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	150—151
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	105—109	...	106½
1,895,445	,,	June 24	3	3	Do. 3 p.c. Deb. ...	83—87	...	85½—87
1,000,000	,,	July 8	5	5	Do. 5 p.c. Red. Deb....	114—117	...	...
209,820	,,	Aug. 12	8½	8½	South Shields Con.	171—173*d*	...	...
1,543,795	,,	Aug. 12	6	6	South Suburban Ord 5 p.c. ...	125—130	...	125
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123	...	121
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	103—108	...	...
888,587	,,	June 7	5	5	Do. 5 p.c. Deb. ...	122—127	...	123½—124
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
647,740	,,	Aug. 12	5	5	Southampt'n Ord. 5 p.c. max.	115—120	...	117
121,275	,,	June 7	4	4	Do. 4 p.c. Deb.	100—105	...	...
350,000	,,	Aug. 12	5½	5½	Swansea 5¼ p.c. Red. Pref. ...	112—117	...	114½—114¾
200,000	,,	June 7	6½	6½	Do. 6½ p.c. Red. Deb. ...	98—103	...	...
94,000	,,	...	...	...	Do. 3½ p.c. Red. Deb. ...	97—102	...	...
1,076,490	,,	Aug. 12	6¾	6¾	Tottenham and District Ord.	149—154	...	150—150½
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	130—135	...	131—132
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	117—122	...	117
334,615	,,	June 7	4	4	Do. 4 p.c. Deb. ...	101—106	...	...
369,774	,,	Aug. 12	7	7	Uxbridge, &c., 5 p.c.	151—156	...	153—155
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	117—122	...	...
1,340,521	,,	Aug. 12	7	7	Wandsworth Consolidated ...	157—162	+2	158—160
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref.*g* ...	118—123	...	...
1,317,964	,,	June 7	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	...
158,400	,,	Aug. 12	6*g*	5	Winchester W.& G. 5 p.c. Con.	114—119	...	...

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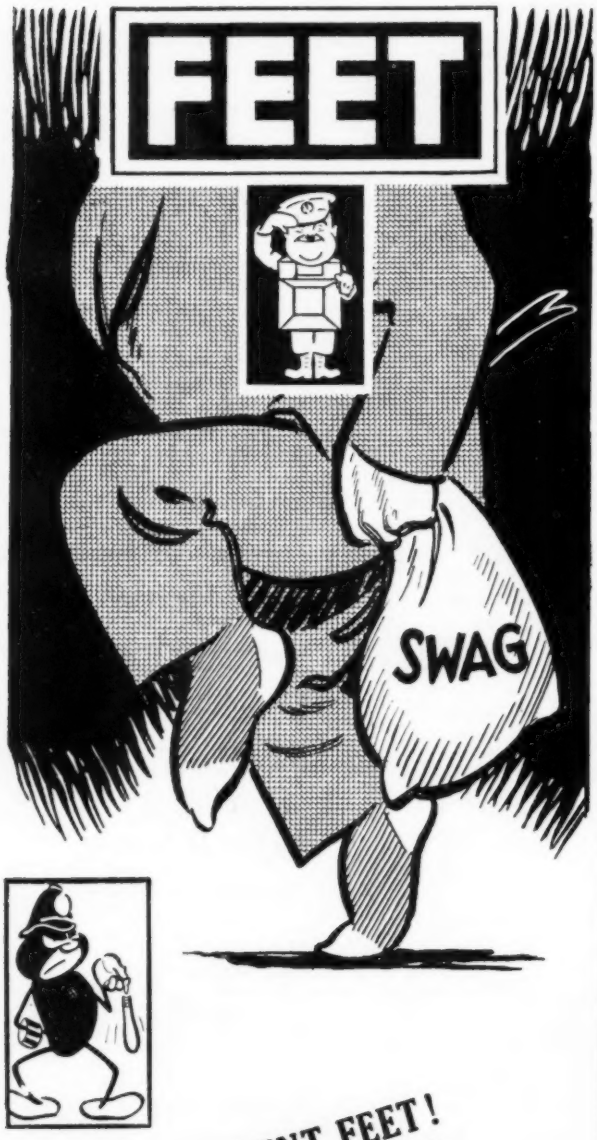

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